March 4, 1958 H. D. BAXTER, JR 2,825,426

DEVICE FOR LOCKING A ROTATABLE ELEMENT IN DIFFERENT POSITIONS OF ROTATION THEREOF

Filed Oct. 18, 1954 2 Sheets-Sheet 1

Fig. 1.

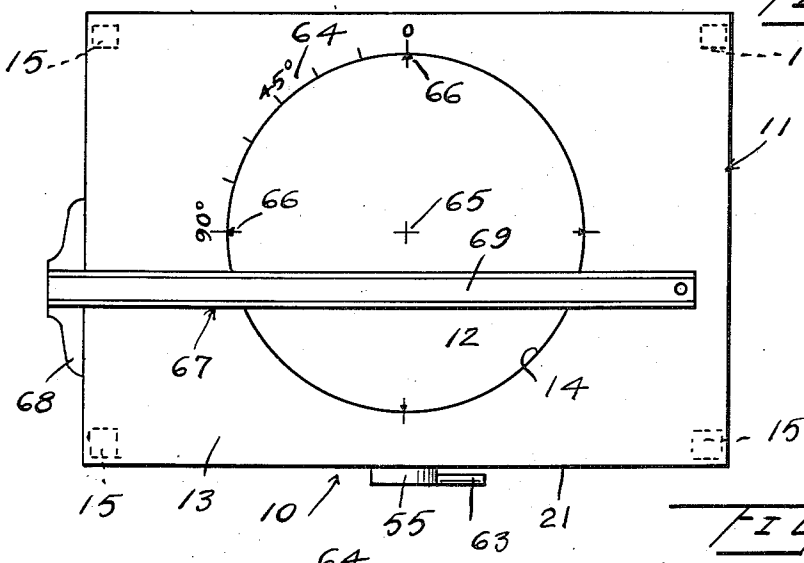
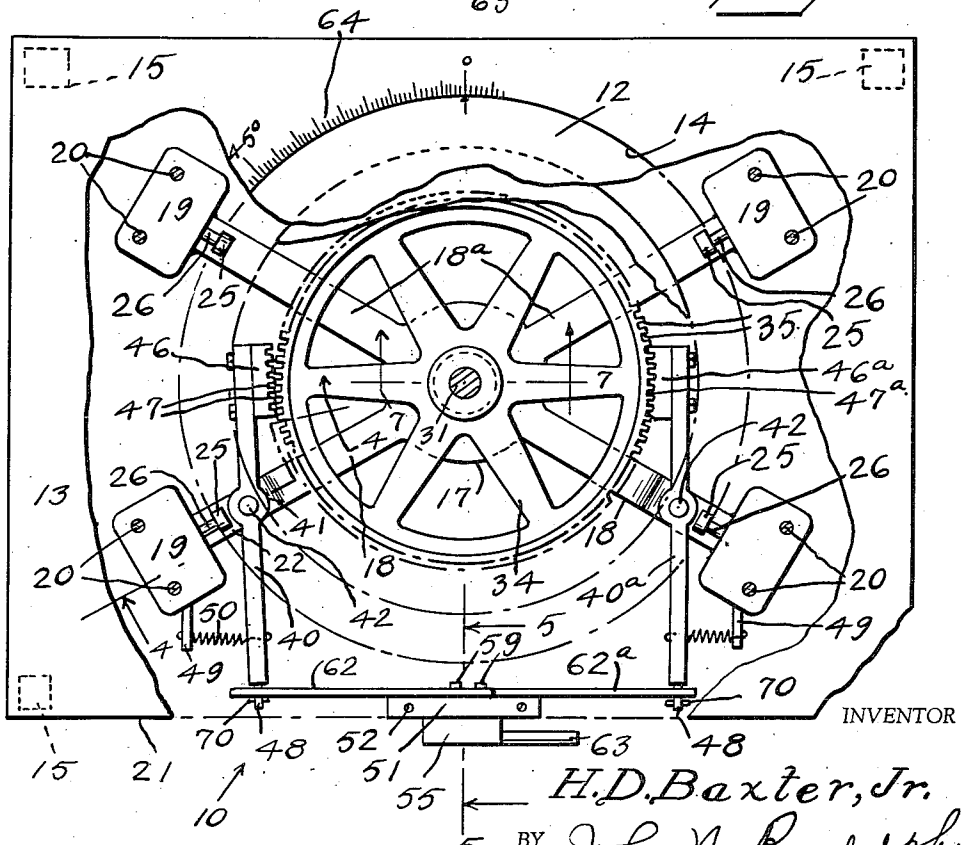


Fig. 2.



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Fig. 3.

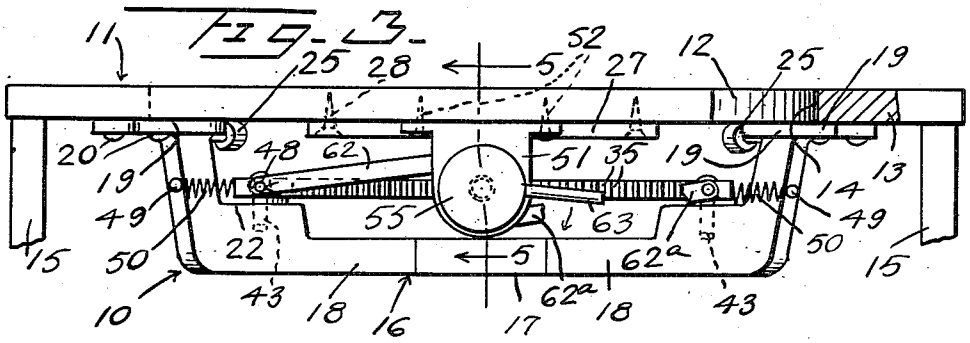


Fig. 4.

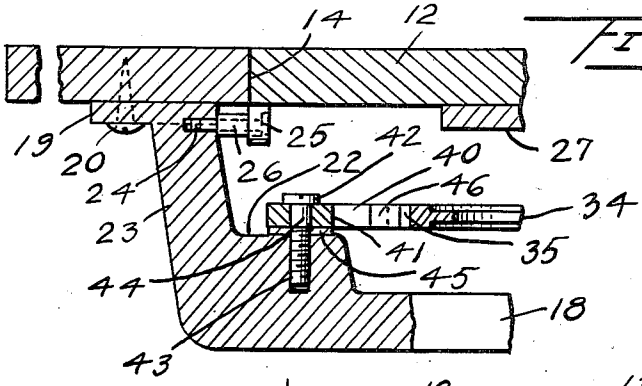


Fig. 5.

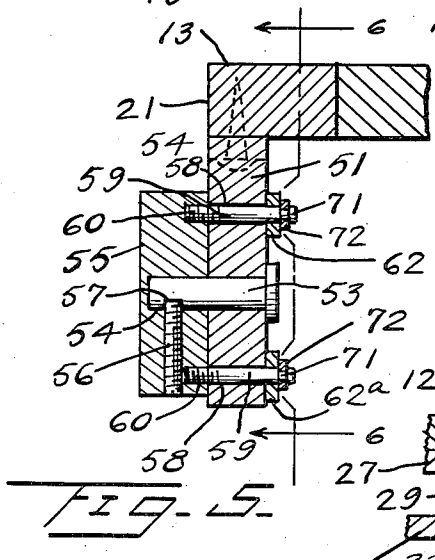


Fig. 6.

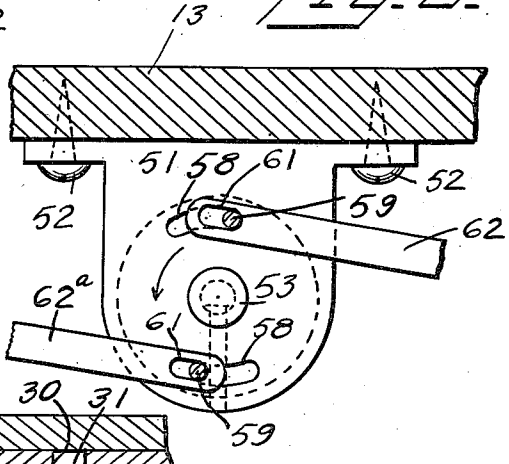


Fig. 7.

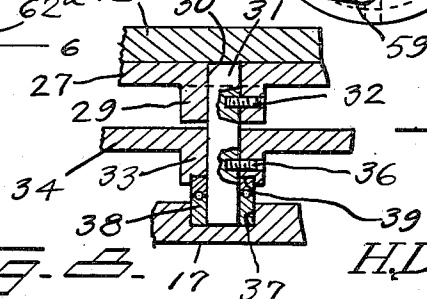
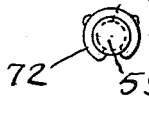


Fig. 8.



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DEVICE FOR LOCKING A ROTATABLE ELEMENT IN DIFFERENT POSITIONS OF ROTATION THEREOF

Homer D. Baxter, Jr., Charleston, W. Va.

Application October 18, 1954, Serial No. 462,781

2 Claims. (Cl. 188—69)

This invention relates to a novel drafting table including a rotatable center section capable of being revolved relative to an outer stationary section of the table and which may be held in any rotatably adjusted position for most efficient use.

More particularly, it is an aim of the present invention to provide a drafting table which will eliminate the need of angles and through the use of which in conjunction with a conventional T-square any desired angle may be accurately drawn.

Another object of the invention is to provide a drafting table of maximum versatility and which especially adapts itself to efficient use by a commercial artist in executing lettering on an arc or in perspective.

A further object of the invention is to provide a drafting table by means of which the sheet may be turned with the rotatable section without moving the sheet relative thereto to obtain the most advantageous working position for the draftsman or artist and with the assurance that the sheet may be accurately returned to its original position.

Still a further object of the invention is to provide a drafting table having means whereby the rotatable section thereof may be held securely in each of 360 different positions of rotation to thereby enable work to be performed with a maximum of accuracy.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a top plan view of the drafting table;

Figure 2 is an enlarged top plan view, partly broken away of the drafting table, to illustrate the mechanism disposed beneath the table top in top plan;

Figure 3 is a front elevational view, partly broken away of the drafting table;

Figure 4 is an enlarged fragmentary detail sectional view, taken substantially along a plane as indicated by the line 4—4 of Figure 2;

Figure 5 is an enlarged fragmentary detail vertical sectional view taken substantially along a plane as indicated by the lines 5—5 of Figures 2 and 3;

Figure 6 is a fragmentary vertical sectional view taken substantially along a plane as indicated by the line 6—6 of Figure 5;

Figure 7 is an enlarged fragmentary vertical sectional view, taken substantially along a plane as indicated by the line 7—7 of Figure 2, and

Figure 8 is a detail view partly in end elevation and partly in section of a portion of the apparatus.

Referring more specifically to the drawings, the improved drafting table in its entirety and comprising the invention is designated generally 10 and includes a table top, designated generally 11, which is preferably substantially rectangular in shape. The table top 11 is composed of an inner section 12 and an outer or marginal section 13. The section 12 is circular or disk shaped and

constitutes a cutout central portion of the outer section 13 and is mounted for rotation in a circular opening 14 of the table top section 13, formed by the cutting out of said central table top section 12. The table top section 12 thus constitutes a turntable. The table top 11 may be supported in an elevated position in any suitable manner as by means of depending legs 15 which are secured to and depend from the corners of the outer section 13.

A spider shaped supporting bracket, designated generally 16, is disposed beneath the table top 11 and includes a central portion 17, a plurality of arms 18 and 18*a*, which radiate from said portion 17 and plate portions 19 which constitute upwardly offset terminals of the arms 18 and 18*a* and which are disposed in a plane parallel to the plane of the central portion 17. The bracket 16 preferably includes four arms 18 and 18*a* which, as seen in Figure 2, are preferably not spaced equal distances apart so that each of the arms 18 and 18*a* forms an obtuse angle with the arm on one side thereof and an acute angle with the arm on the opposite side thereof, as illustrated in Figure 2. The plate portions 19 bear against the underside of the outer section 13, outwardly with respect to its opening 14 and are secured thereto by suitable headed fastenings 20 which extend upwardly therethrough and are secured in said outer section 13.

One longitudinal edge of the table top 11, as for example the bottom edge 21 thereof, as seen in Figures 1 and 2, constitutes the front edge of said table top. The two arms 18 are disposed nearer said front edge 21 than the arms 18*a* and at substantially corresponding angles thereto. The arms 18 form an obtuse angle with one another, as seen in Figure 2. Said arms 18 differ from the arms 18*a* only in that the arms 18 are provided with upwardly offset upwardly facing step portions or surfaces 22 adjacent their outer ends and which are disposed above the level of the upper surfaces of the inner portions of the arms 18 and substantially below the level of the upper surfaces of the plate portions 19. Each of the arms 18 and 18*a* includes an upwardly extending portion 23, on the upper ends of which the plate portions 19 are formed. A spindle 24 is anchored in each arm portion 23, near its upper end, and has a part extending inwardly therefrom on which a roller 25 is journalled. A spacing sleeve 26 is preferably mounted on each spindle 24 between the roller 25 and the adjacent arm portion 23. The rollers 25 are disposed beneath portions of the turntable 12 and are disposed to partially support said turntable for free rotation in the opening 14.

The central portion of the underside of the turntable 12 rests flush against the upper side of a disk or plate 27 which is secured to the turntable 12 by suitable headed fastenings 28 which extend upwardly therethrough and into the turntable 12 but which do not project through the upper surface of said turntable. The disk or plate 27 is provided with a centrally disposed depending boss 29 having a central bore extending upwardly into the plate 27 to form a socket 30, as best seen in Figure 7. The upper end of a shaft 31 is seated in the socket 30 and is secured therein by a setscrew 32 which is threaded radially through the boss into the socket 30. The shaft 31 extends downwardly from the boss 29 through the central hub portion 33 of a wheel 34. The wheel 34 is of relatively large diameter and the periphery thereof has teeth 35 extending completely therearound. In the embodiment of the invention as disclosed, the periphery of the wheel 34 is provided with 180 teeth 35. As seen in Figure 7, a setscrew 36 is threaded radially into a lower portion of the wheel hub 33 and against the shaft 31 to secure the wheel to said shaft. The central portion 17 of the supporting bracket 16 is provided with a centrally disposed upwardly opening socket 37 in which is seated the lower end of a thrust bearing 38, into which the

lower portion of the shaft 31 extends. The hub 33 is provided with a downwardly opening recess or socket 39 in its lower portion which fits over the upper part of the thrust bearing 38. Thus, the thrust bearing 38 provides an antifriction support for the shaft 31, wheel 34, plate 27 and turntable 12, which are mounted on and fixed to said shaft. However, as previously stated, the turntable 12 is in part supported adjacent its periphery by the four rollers 25.

A pair of corresponding levers 40 and 40*a* have bearing portions 41 spaced from the ends thereof and which are disposed over the steps 22 of the bracket arms 18. As best seen in Figure 4, headed pins 42 extend downwardly through said bearing portions 41 and have threaded lower ends 43 which are anchored in the step portions 22 and unthreaded upper stem portions 44 on which the bearing portions 41 are journalled. A washer 45 may be positioned between each step 22 and the bearing portion 41 disposed thereabove to facilitate the free swinging movement of the levers on the pins 42. The levers 40 and 40*a* have complementary inner ends which are disposed outwardly with respect to nearly diametrically opposite portions of the periphery of the wheel 34. Blocks 46 and 46*a* are secured in inner adjacent sides of said inner ends of the levers 40 and 40*a*, respectively, and are disposed longitudinally thereof. The blocks 46 and 46*a* have inner adjacent faces, facing toward the periphery of the wheel 34 and which are provided with transversely extending teeth 47 and 47*a*, respectively, sized for intermeshing engagement with the teeth 35. The opposite ends of the levers 40 and 40*a* extend from the pivots 42 toward and to adjacent the front edge 21 of the table top 11 and are provided with restricted terminal portions 48. The portions 23 of the two bracket arms 18 are each provided with a stud 49 which is fixed thereto and which extends therefrom toward said front edge 21. The studs 49 are spaced outwardly from the last mentioned end portions of the levers 40 and 40*a* and provide anchors for pull springs 50, the outer ends of which are connected thereto and the inner ends of which are connected to the levers 40 and 40*a* adjacent their restricted terminals 48. The springs 50 urge the outer ends of the levers 40 and 40*a* to swing away from one another and accordingly urge the inner ends of said levers and the blocks or racks 46 and 46*a* to swing toward one another and toward the toothed periphery of the wheel 34.

A hanger 51 is secured to the underside of the outer table top section 13 by fastenings 52 and is disposed with an outer side thereof preferably flush with the front edge 21 and intermediate of the ends of the table top 11. A headed pin 53, as best seen in Figure 5, extends outwardly through and is journalled in said hanger member 51 and into a central socket 54 which opens outwardly of an inner side of an actuating block 55, which inner side bears turnably against the outer side of the hanger member 51. The block 55 is secured to the pin 53 by a setscrew 56 which is threaded into said block at substantially a right angle to the axis of the pin 53 and which has an inner end seating in a radially opening recess 57 of the pin 53 to thus detachably secure the block 55 to said pin. The hanger 51 is provided with arcuate slots 58 disposed above and beneath the pin 53. Pins 59 extend loosely through said slots 58 and have threaded ends 60 which are anchored in the block 55. The opposite ends of the pins 59 project from the inner side of the hanger 51 loosely through longitudinally elongated slots 61 in adjacent ends of a pair of links 62 and 62*a*. The links 62 and 62*a* extend in opposite directions from the hanger 51 and have remote ends which engage over and are pivotally connected to the terminals 48 of the levers 40 and 40*a*, respectively. A handle 63 is secured to and projects outwardly from a portion of the periphery of the actuating block 55.

The upper surface of the outer table top section 13, around the opening 14 thereof, is provided with degree

markings and graduations 64. The upper surface of the turntable 12 is provided with a cross 65 the center of which designates the center of said turntable and is provided near its periphery with outwardly directed arrows 66 disposed in alignment with the arms of the cross 65 and which are thus spaced 90 degrees apart. A conventional T-square is adapted to be used with the drafting table 10. The head 68 of the T-square 67 bears against an end of the outer section 13 so that the bar 69 of the T-square extends across the turntable 12 and parallel to the front edge 21 of the table top.

As illustrated in Figure 2, the blocks or racks 46 and 46*a* are spaced from the pivots 42 of their levers slightly different distances. Thus, when the teeth 47*a* are meshing with the wheel teeth 35 the teeth 47 will be out of mesh with the teeth 35 and conversely. Accordingly, with the use of the two racks 46 and 46*a* and the wheel 34 having 180 teeth 35, it is possible to lock the turntable 12 in any one of 360 equally spaced different positions of rotation. Assuming that a piece of drawing paper is secured in a conventional manner on the upper surface of the turntable 12 and it is desired to turn the paper, for example, to a position at a 45 degree angle to its initial position, the draftsman or artist grasps the handle 63 and by turning said handle and the block 55 clockwise as seen in Figure 3, will cause the pins 59 to turn with the block 55 in the same direction or counterclockwise as seen in Figure 6. During the initial movement of the block 55 and pins 59, the link 62*a* will be initially moved to actuate the lever 40*a* to swing said lever clockwise as seen in Figure 2 to disengage its rack 46*a* from meshing engagement with the wheel teeth 35, due to the fact that the lower pin 59 is engaging the outer end of the slot 61 of said link 62*a*. However, during this initial movement of the link 62*a* and lever 40*a*, the link 62 and lever 40 will not be actuated since as seen in Figure 6, the upper pin 59 is engaging the inner end of the slot 61 of the link 62 and will therefore move initially toward the outer end of said slot 61. By the time that the teeth 47*a* are disengaged from the teeth 35, the upper pin 59 will be in engagement with the outer end of the slot 61 of link 62, after which both levers 40 and 40*a* will be rocked simultaneously for swinging their inner ends and the racks 46 and 46*a* carried thereby away from one another and away from the teeth 35. With the racks 46 and 46*a* held disengaged, the turntable 12 may be manually turned with the supporting plate 27, shaft 31 and wheel 34. Assuming that the turntable is turned through an arc of 45 degrees in a counterclockwise direction as seen in Figure 1 to position the uppermost arrow 66 of Figure 1 in radial alignment with the 45 degree graduation 64, when this has been accomplished pressure on the handle 63 is released. The springs 50 will then urge the outer ends of the levers 40 and 40a to swing away from one another for turning the block 55 in the opposite direction or clockwise as seen in Figure 6 due to a pull being exerted on the pins 59 by the links 62 and 62*a*. However, as the rack teeth 47*a* mesh with the teeth 35 in the even degree positions of the turntable 12 and as the turntable 12 is now a 45 degree or odd degree position, the teeth 47 will assume meshing engagement with the teeth 35 while the teeth 47*a* will rest against the outer ends of the teeth 35 and out of mesh therewith. Thus, the upper pin 59 will then be in engagement with the outer end of the slot 61 of the link 62 while the lower pin 59 will engage the inner end of the slot 61 of the link 62*a*. It will thus be seen that the turntable may be readily locked in any one of 360 different equally spaced positions of rotation.

Thus, the need for angles is eliminated since the drawing paper may be positioned at any desired angle so that lines may be drawn thereon at any desired angle with the use of the T-square 67. Obviously, the turntable can be very conveniently employed by a draftsman or artist in lettering on an arc as the paper can be turned with the

turntable without lifting it or moving it relatively thereto and with the assurance that the paper can be returned with the turntable to its exact original position. Numerous other advantages of the structure will also be apparent to artists and draftsmen. As for example, in making perspective drawings an imaginary diminishing point can be established and with the use of the T-square and by slightly turning the turntable and paper a perspective drawing can be accurately produced.

The links **62** and **62***a* may be detachably connected in any suitable manner to the lever ends **48** and pins **59**. For example, cotter pins **70** may extend through the lever ends **48** outwardly of the links, and the outer exposed ends of the pins **59** may be provided with grooves **71** for receiving spring split rings **72**, as seen in Figure 8, for retaining the links in engagement with said pins.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. An apparatus of the character described comprising a wheel having a toothed periphery, a shaft extending centrally through and fixed to said wheel, a supporting structure in which the shaft is journaled, manually actuated means including a part pivotally mounted on the supporting structure and having a rack swingably movable into and out of meshing engagement with the wheel teeth for locking the wheel in different rotatably adjusted positions relative to said supporting structure, said manually actuated means including a second part pivotally mounted on said supporting structure and having a second rack swingably movable into and out of meshing engagement with said wheel teeth, said racks being spaced different distances from the pivots of said parts whereby when either rack is in engagement with the wheel teeth the outer ends of the teeth of the other rack will be in abutting engagement with the outer ends of the wheel teeth whereby said wheel may be locked by said manually actuated means in twice as many different positions of rotation as the number of teeth provided on said wheel, said parts of the manually actuated means comprising levers, said racks being secured to complementary ends of said levers, said pivots being spaced from the ends of the levers, a hanger secured to and depending from a part of said supporting structure, a manually turnable part journaled on said hanger, links having corresponding ends pivotally connected to the opposite ends of said levers, and means pivotally connecting the opposite ends of said links to said manually turnable part on opposite sides of the journal thereof and constructed and arranged whereby rotation of said manually turnable part in one direction will initially cause one of said links to exert a pulling force on the lever the rack of which is in mesh with the wheel teeth to disengage said rack from meshing engagement with the wheel teeth and will subsequently cause both links to exert pulling forces simultaneously on both levers for swinging the racks simultaneously away from said toothed wheel.

2. An apparatus as in claim 1, said means connecting the manually turnable part to said links including pins, said links having longitudinally elongated slots forming a part of said means and engaging said pins, said slots permitting limited movement of the pins relative to the links, said slots having outer ends engaged by the pins for exerting pulling forces on the links, the link, connected to the lever the teeth of the rack of which is in abutting engagement with the outer ends of the wheel teeth, having the outer end of the slot thereof spaced from the pin which engages said slot when a pulling force is initially exerted on the other link, and spring means connecting the levers to said supporting structure and urging the levers to swing in a direction for moving the racks toward the toothed wheel.

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