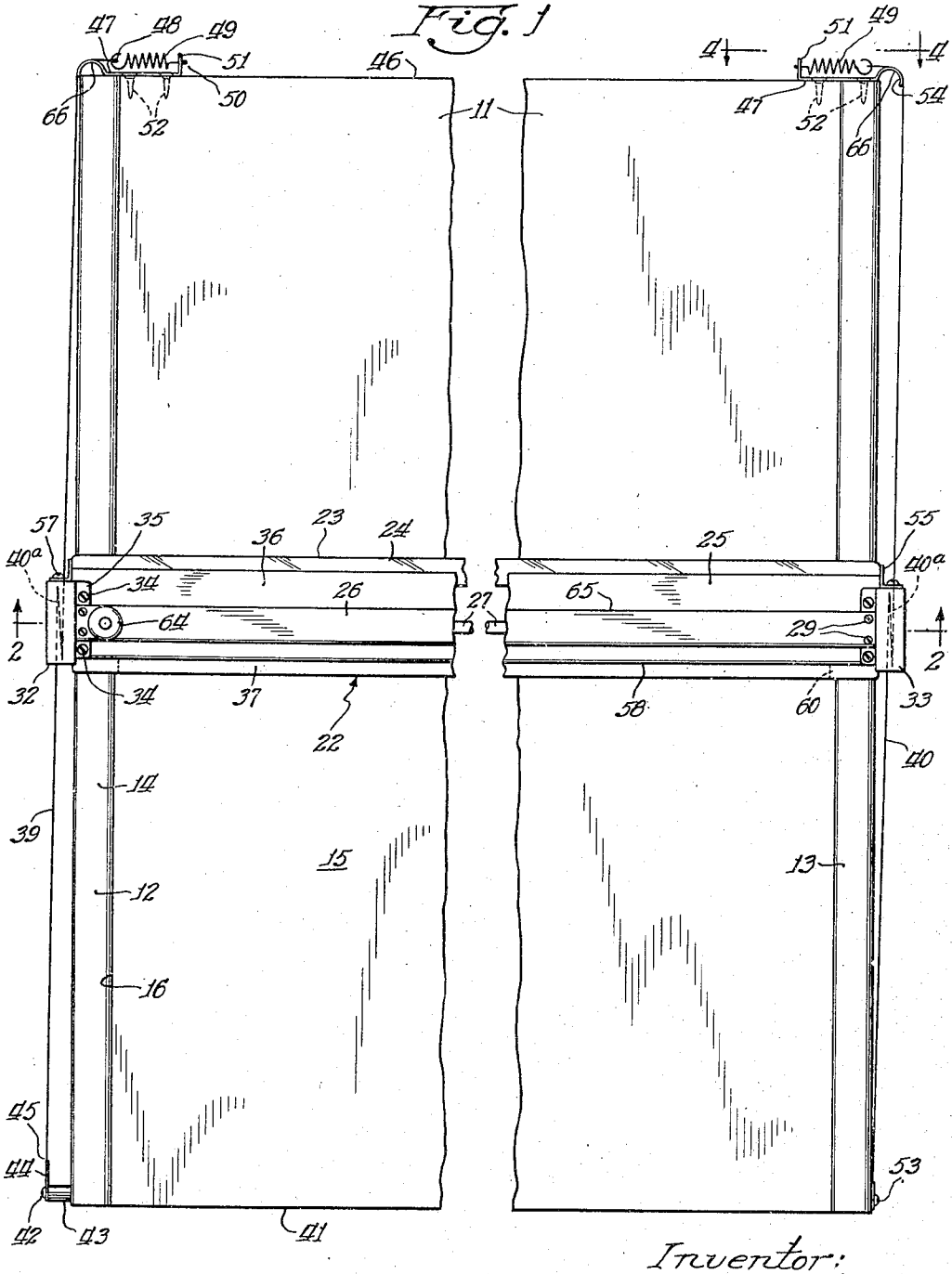
Nov. 15, 1949 G. E. FROELICH 2,488,284

PARALLEL RULING MEANS

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Fig. 1



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Fig. 2

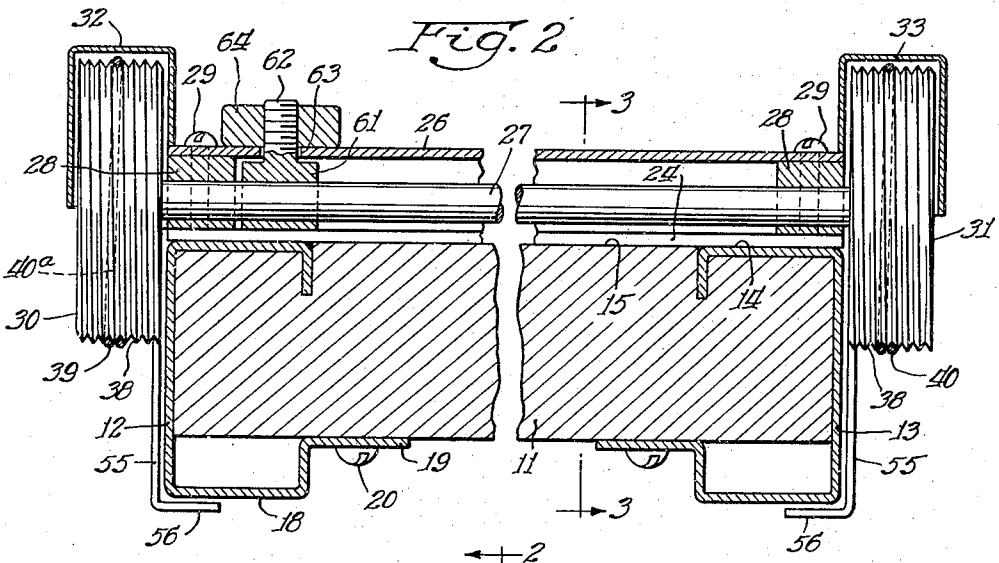


Fig. 3

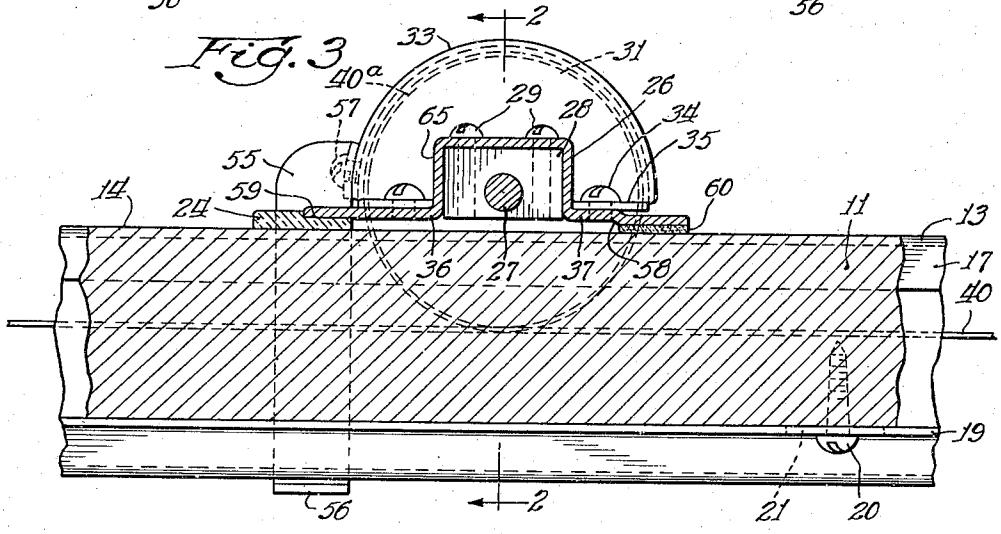
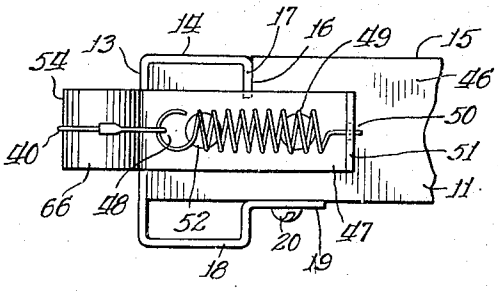


Fig. 4



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Patented Nov. 15, 1949 2,488,284

UNITED STATES PATENT OFFICE

2,488,284

PARALLEL RULING MEANS

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Application September 20, 1946, Serial No. 698,180

5 Claims. (Cl. 33—80)

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This invention relates to parallel ruling means for mechanical drawing tables which commonly include a large size drawing board with a straight edge device spanning the board and a cable engaging the board and straight edge device for guiding the straight edge device in its movements on the board.

Among other objects, the present invention aims to provide an improved means of this character of enhanced simplicity of operation and economy of manufacture while insuring markedly easy, quiet and consistently true operation at all times.

In an important aspect, the invention contemplates a combined straight edge device and parallel rule attachment which can be applied to any drawing board by the user thereof with a minimum of effort, one purchase by the user covering everything that is necessary to the installation.

These and other objects and advantages will be apparent from the following detailed description, taken together with the accompanying drawings, of an illustrative embodiment of the invention, and in which drawings—

Figure 1 is a plan view of parallel ruling means embodying the present invention, parts being broken away intermedially to save space;

Figure 2 is an enlarged cross-sectional view taken on the line 2—2 of Figure 1, looking in the direction of the arrows, and similarly broken away;

Figure 3 is a section taken on the line 3—3 of Figure 2; and

Figure 4 is an elevational view of one of the rear corners of the board showing the wire attachment and being a view on the line 4—4 of Figure 1.

Referring in detail to the illustrative construction shown in the drawings, the reference numeral 11 indicates a drawing board of the usual wood construction and which may be in relatively large sizes. Along its side edges the drawing board 11 desirably has steel cleat pieces 12 and 13, these being in this instance in the form of a box-like member, having its upper face 14 depressed into the board at each side so as to be flush with the working surface 15 of the board, a kerf 16 in the board receiving the down-turned flange 17 of the cleat. At its lower face 18, each cleat is extended downwardly below the board to enhance its height and is then bent up to engage the board as at 19 where a screw 20 passing through a slot 21 fixes the engagement. This slot may be elongated in the direction of the cleat member so as to permit adjustments of the cleat with respect to the board.

For parallel ruling purposes, the board 11 has associated therewith a straight edge device indicated generally by the numeral 22, which is attached to the board to slide over the drawing

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surface 15 from front to rear of the board by translatory movements in which the straight edge device is maintained in parallel relation with the board so that lines drawn by aid of the straight edge 23 of the edge strip 24 of the straight edge device will be parallel to each other in all positions of the straight edge device.

In accordance with the present invention, the straight edge device 22 comprises a blade body 25, preferably of aluminum for lightness, strength and ease of adjustability, this body being of sufficient length to span the board from side to side thereof. Adjacent its longitudinal center line the blade body is upwardly channeled as at 26 to provide an inverted housing for a roller shaft 27 which extends from end to end of the blade body and is journaled at each end thereof in a bearing block 28 which is secured within the channeled housing 26 as by screws 29. The bearing blocks advantageously incorporate a metal impregnated with oil, such as is available on the market.

To the ends of the roller shaft 27 which project beyond the bearing blocks 28 are suitably secured, as by press-fit or welding, a relatively large roller or wheel 30 at the left-hand end of the blade body 25 and 31 at the right-hand end. Semi-circular cover or guard plates 32 and 33 respectively are secured over the rollers 30 and 31, as by screws 34 which pass through flanges 35 extending laterally from each guard plate, the screws passing into the flat margins 36 and 37 of the blade body 25.

The guide rollers 30 and 31 are desirably grooved advantageously each in a spiral as at 38 which is here shown in the form of an external screw thread on the peripheral edge of the roller, this thread in the present instance being what might be termed a right-hand screw thread in the sense that when one looks at either roller at an end thereof the threads rotating to the right proceed away from the eye of the beholder, for the purpose next described.

Further in accordance with the present invention, a flexible member comprising cable sections 39 and 40, here shown as sections of wire, such as piano wire, are looped about the guide rollers 30 and 31 and anchored to the drawing board 11 on opposite sides of the straight edge device, that is, adjacent the front and rear edges of the drawing board to provide guide wires or guide cords for the straight edge device. Each wire is passed first under, then up and over the roller and down again as at 40a, the wire loop 40a lying in or trained in the groove 38 of the roller threads in each case, and thus meshing therewith, following the spiral. The angle for each flexible member is coordinated with or substantially equal to the lead angle of the groove of its roller respectively, so as not to buckle or distort the wire.

Adjacent the front edge 41 of the drawing board the wire 39 is anchored thereto as by a screw 42 passing into the side of the board through the steel cleat 12. This screw 42 is elongated and carries a spacer sleeve 43 which receives between the outer end thereof and the head of the screw 42 the perforated clip 44 which is suitably secured as at 45 to the wire 39, thus spacing this end of the wire 39 laterally outwardly of this left-hand side of the drawing board. Adjacent the rear edge 46 of the drawing board, the wire 39 inclines laterally inwardly toward the board edge and thereat passes slidably about an anchor plate 47 where it is anchored as at 48 to one end of an expansion coil spring 49, the other end of which is anchored as at 50 to a projection 51 extending rearwardly of the anchor plate 47, the latter being secured as by screws 52 to the rear edge 46 of the board.

At the other side of the board, the wire 40 is screwed as at 53 tightly to the board adjacent the front edge 41 thereof, and then, after being looped about the roller 31, inclines laterally outwardly from the cleat 13 toward the rear edge 46 of the board where it is anchored to another one of the anchor plates 47. At this side of the board, however, the anchor plate 47 has its screws 52 located closer to the board edge and so much so that the anchor plate is offset at its outer end as at 54, laterally of the board at this side, to accommodate and maintain the lateral inclination of the wire 40 already referred to, the wire 40 being anchored to its anchor plate 47 in a manner similar to the wire 39 in other respects and which need not be repeated.

Thus, in this instance both wires 39 and 40 incline laterally in the same direction and define inclined sides of a parallelogram, the other two sides of which are the front edge 41 and rear edge 46 of the board, and both wires are resiliently connected as by the anchor coil springs 49 to the rear edge of the board so as to maintain the wires taut when the straight edge device 22 moves relatively to the wires which nevertheless remain looped about the rollers 30 and 31 respectively, in all movements of the straight edge device.

Since the wires are maintained taut they are held in parallel to each other and the inclination of the wires accommodates the travel thereof, and particularly the loop 40*a* thereof, in the spiral grooves 38 of the rollers. In other words, when the straight edge device is near the front edge 41 of the drawing board, the loop 40*a* of the wire 39 is at the left-hand end of the roller 30, that is, the end of the spiral groove 38 farthest away from the drawing board side. At the same time, the loop 40*a* of the wire 40 is at the left-hand end, which in this instance, is the end nearest the drawing board, of the spiral groove 38 of the roller 31. As now the straight edge device moves toward the rear of the board, the loops 40*a* of the wires 39 and 40 travel to the right relatively on their respective rollers so that when the straight edge device is near the rear edge 46 of the board the wire loop 40*a* of the wire 39 is at the end of the roller 30 nearest the drawing board while the loop 40*a* of the wire 40 is at the end of the roller 31 farthest from the drawing board.

Since the rollers 30 and 31 are keyed to the shaft 27 to rotate simultaneously therewith and are of equal diameter the straight edge device is maintained at all times parallel to the edges 41 and 46 of the drawing board, once, it has been initially so adjusted and the wires anchored in place.

The upwardly channeled body of the blade at 26 provides a chine structure which both strengthens the blade body and also serves as a handle for causing movement of the blade.

To maintain the blade body 25 of the straight edge device close to the drawing board surface 15 at all times, and particularly if the drawing board be mounted as it may be upon a stand by which angular movements from horizontal to vertical of the drawing board are permitted, a pair of depending arms 55 are provided at each end of the straight edge device which slidingly embrace, as by inturned portions 56 of the arms, the steel cleats 12 and 13 respectively at each side of the drawing board. Each arm 55 may be secured as by a screw 57 to one of the semi-circular guard plates 32 and 33 respectively and to hang therefrom as described. The relatively great vertical length of these arms 55, accommodated by the downwardly offset walls 18 of the cleats 12 and 13, insures against undue rocking movements of the blade body 25.

The blade body 25 is desirably offset downwardly as at 58 along its margin 37 so as to compensate for the thickness along its other margin 36 of the usual transparent strip 24 which may be suitably secured thereto as at 59, by cement or the like. If desired the margin 37 may have felt pads 60 thereunder.

It may at times be desired to impose a drag upon the movements of the straight edge device or inhibit such movement entirely, for example when the board is disposed at a great angle approaching the vertical, and, for this purpose, a frictional drag is here provided in the form of a collar block 61 disposed within the channeled housing 26 of the blade body 25 encircling the shaft 27 and provided with an upstanding screw-threaded stud portion 62 which passes outwardly through a hole 63 in the housing 26 and has screwed thereonto a knurled thumb nut 64, which when screwed down pulls the collar block 61 up so as to jam the shaft and prevent or restrain turning of the latter.

Since normal working positions of the drawing board, for convenience of the draftsman, dictate an elevation of the rear edge 46 above the front edge 41, the upper edge 65 of the inverted channeled housing 26 provides a convenient ledge for the draftsman's pencils, triangles, etc.

The anchor plates 47 are desirably rounded as at 66 where the wires pass thereabout, to avoid a sharp edge which might cut the wire and also to permit the springs 49 to exert a tautening influence upon the wires in spite of the bend therein adjacent the spring. Furthermore, the relatively large diameter of the rollers 30 and 31 avoid a sharp bend in the wire so that a wire of the tensile strength and hardness of a piano wire may be used without kinking, and this further insures smooth and quiet movements of the straight edge device while maintaining said movements in consistently true parallelism at all times. The wires and anchoring means for the wires may be sold with the blade as a unit.

If the drawing board should swell or shrink because of atmospheric conditions, the springs 49 will compensate for such changes in dimensions of the drawing board and maintain the wires 39 and 40 taut and parallel. No moving cords are required and no oiling is necessary. The device can be readily applied to any drawing board and even one without the steel cleats 12 and 13, although the latter are preferred for ease of operation. The blade being of aluminum may be

readily bent back into original shape if it becomes bowed after a period of use, or may be bent to stay in any desired position to make the edge straight. If it be desired to adjust the device, one of the wires may be loosened, the blade fixed in parallel by the aid of an ordinary T-square and the wire re-tightened.

The wires will not stretch as do fiber or textile cords and will wear indefinitely. The threaded roller causes the loop 40*a* of the wire to assume a somewhat helical form at all times, as shown in the drawings which guards against the wire interfering with itself and insures free running.

The invention is not intended to be limited to details of construction shown for purposes of illustration, and such changes may be made as fall within the scope of the appended claims without departing from the invention.

The invention having been described, what is here claimed is:

1. Parallel ruling means comprising a drawing board, a straight edge device spanning the board, a roller carried at each end of the straight edge device, a spiral groove on each roller, a flexible member intermediately looped about each roller and trained in the grooves respectively, and an anchorage on the board for the flexible members on opposite sides of the straight edge device, whereby the straight edge device is movable relatively to the flexible members but confined to translatory movements with respect to the board, an anchorage for each flexible member being at a different distance from the board at one edge of the board than at the other edge to place the flexible members at an angle to the side edges of the board to accommodate lateral displacement of the flexible members with respect to the spiral grooves, said angle for each flexible member being substantially equal to the lead angle of the groove of its said roller respectively.

2. Parallel ruling means comprising a drawing board, a straight edge device having a shaft running longitudinally thereof, a roller carried at each end of the shaft and keyed to rotate therewith, a spiral groove on each roller, a flexible member intermediately looped about each roller and trained in the grooves respectively, and an anchorage on the board for the flexible members on opposite sides of the straight edge device, whereby the straight edge device is movable relatively to the flexible members but confined to translatory movements with respect to the board, an anchorage for each flexible member being at a different distance from the board at one edge of the board than at the other edge to place the flexible members at an angle to the side edges of the board to accommodate lateral displacement of the flexible members with respect to the spiral groove, said angle for each flexible member being substantially equal to the lead angle of the groove of its said roller respectively.

3. Parallel ruling means comprising a drawing board, a straight edge device having a shaft running longitudinally therethrough, a roller carried at each end of the shaft and keyed to rotate therewith, a spiral groove on each roller, a flexible member intermediately looped about each roller and trained in the grooves respectively, and an anchorage on the board for the flexible members on opposite sides of the straight edge device, whereby the straight edge device is movable relatively to the flexible members but confined to translatory movements with respect to the board, an anchorage for each flexible member being at a different distance from the board at one edge of the board than at the other edge to place the flexible members at an angle to the side edges of the board to accommodate lateral displacement of the flexible members with respect to the spiral grooves, said angle for each flexible member being coordinated with the lead angle of the groove of its said roller respectively, the flexible members being of wire and the rollers being of relatively large diameter with respect to the shaft so as not to unduly bend the wire.

4. Parallel ruling means comprising a straight edge device having a shaft running longitudinally therethrough, a roller carried at each end of the shaft and keyed to rotate therewith, a spiral groove on each roller, a flexible wire member intermediately looped about each roller and trained in the grooves respectively, and an anchorage for the flexible members on opposite sides of the straight edge device, whereby the straight edge device is movable relatively to the flexible members but confined to translatory movements thereof, said anchorage including a tension coil spring attached to each wire an anchorage for each flexible member holding the flexible members at an angle to accommodate lateral displacement of the flexible members with respect to the spiral grooves, said angle for each wire being coordinated with the lead angle of the groove of its roller respectively.

5. In parallel ruling means, in combination, a straight edge device, a shaft rotatably carried longitudinally thereof, a roller at each end of the shaft rigid with said shaft, said rollers being spirally grooved by threads pitched in the same direction, a flexible member intermediately looped about each roller and trained in the grooves respectively, and anchorages for each flexible member on opposite sides of the straight edge device, a line joining the anchorages for the flexible member for each roller being at an angle to the straight edge device other than a right angle and said lines being parallel, to accommodate shifting movements of the flexible members relatively axially of the rollers in translatory movements of the straight edge device, said angle corresponding to the lead angle of the grooves of the rollers.

GEORGE E. FROELICH.

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