

[54] **DRAFTING INSTRUMENT FOR DRAWING PARALLEL LINES**

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[51] Int. Cl. **B43I 13/24**

[58] Field of Search..... 33/110, 81, 40

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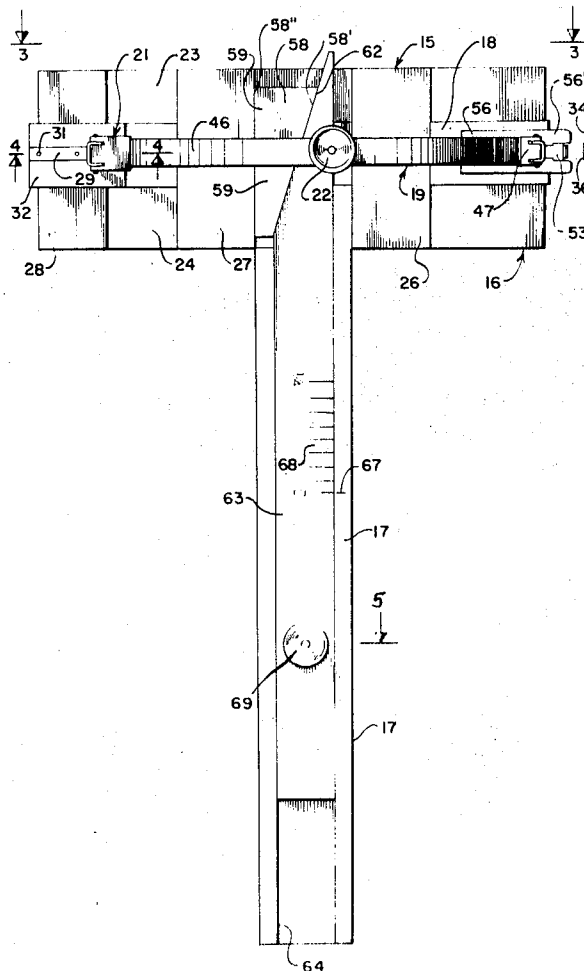
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[57] **ABSTRACT**

This drafting instrument provides a head assembly including spaced parallel members providing for a guide slot for the longitudinal movement of an advancing head slide. This head slide is held between the members by a transversely extending member that overlies the upper surface of the parallel members and which has an inclined forward edge. Extending laterally from the head assembly is a drawing edge arm in which there is a slide that can be laterally adjusted thereover and which has a corresponding inclined edge serving as a stop edge for the forward movement of the head slide by engagement of the forward inclined edge of its transverse member with the inclined edge of the arm slide. By adjusting the arm slide any measured distance can be provided by which the spacing of the lines drawn over the transversely extending arm edge can be set to different distances.

6 Claims, 10 Drawing Figures



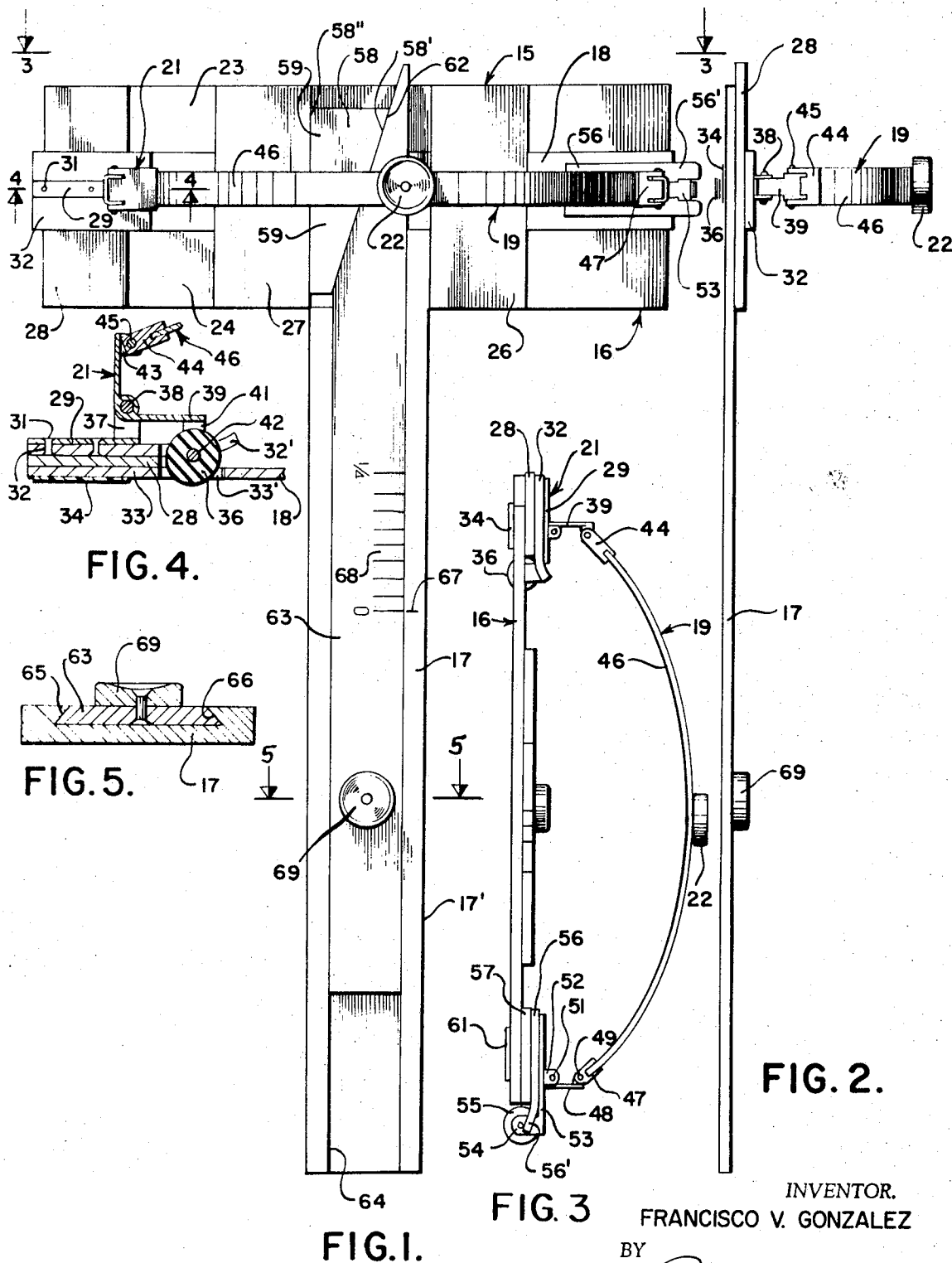


FIG. 2.

FIG. 3

FIG. 1.

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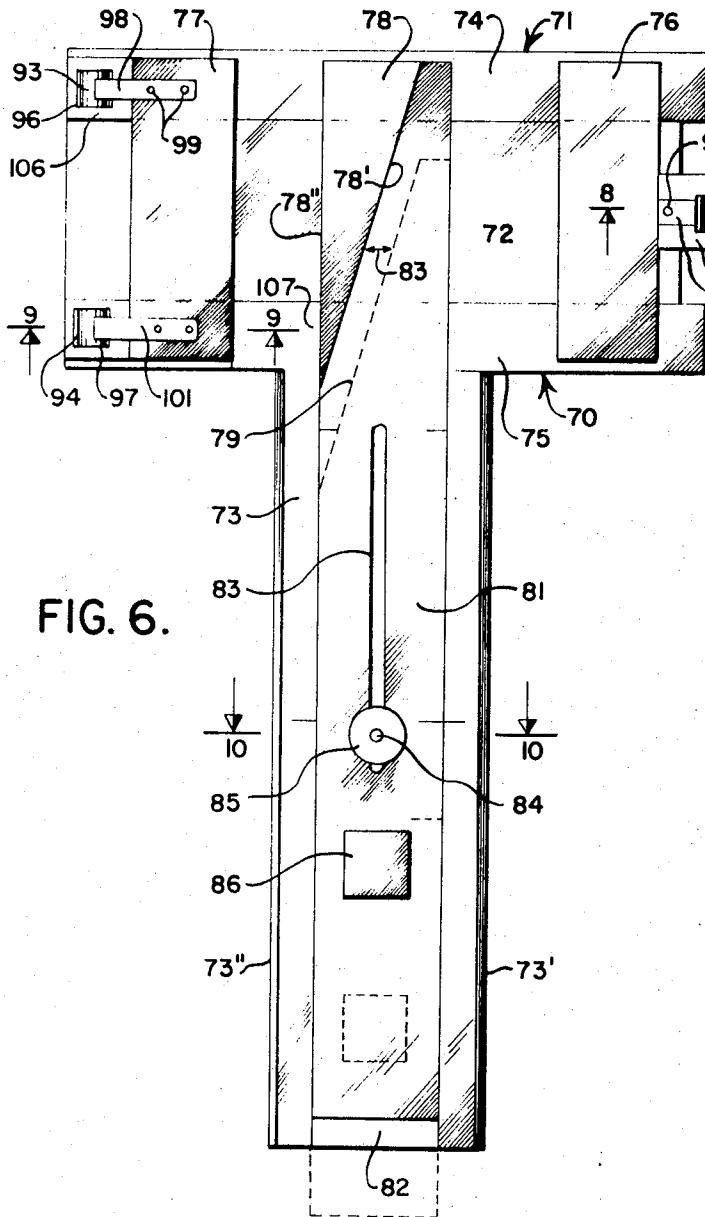


FIG. 6.

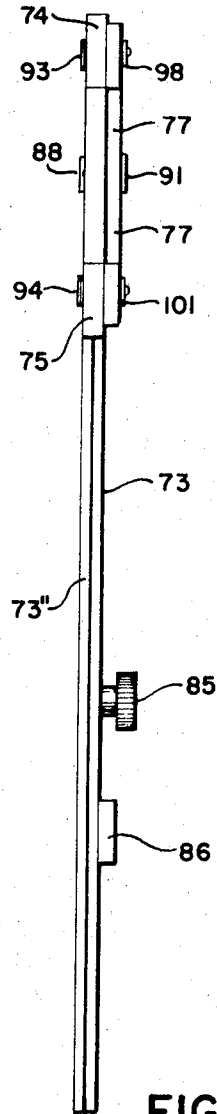


FIG. 7.

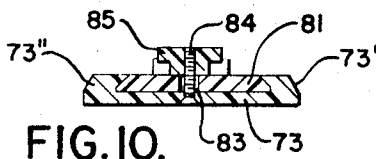


FIG. 10.

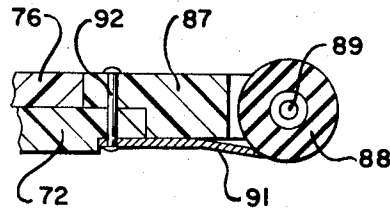


FIG. 8.

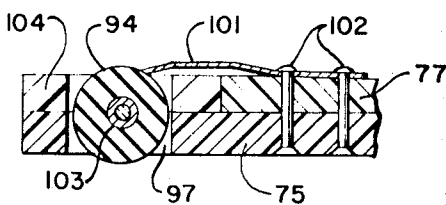


FIG. 9.

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DRAFTING INSTRUMENT FOR DRAWING PARALLEL LINES

This invention relates to a drafting instrument for drawing parallel lines.

It is the principal object of the present invention to provide a drafting instrument which can be easily manipulated so that parallel lines can be drawn without having to each time align the drawing edge of the instrument to a new location and wherein once the instrument is set for a desired measured spacing the instrument is automatically manipulated and operated to give the spacing each time.

It is another object of the invention to provide a drafting instrument for drawing parallel lines which may require only a depressing of a spring and the return of the spring serving to provide the second movement and the drawing of the main body of the head assembly to the position of the head slide which has already been advanced.

It is still another object of the invention to provide a drafting instrument for drawing parallel lines in which the slide and the head assembly are provided with wheel rollers for supporting the instrument and also will have adequate gripping engagement with the table or paper surface and in which slipping or sliding of the instrument thereover is minimized, allowing only for an exact advancing of the head slide and of the main body thereafter.

Other objects of the present invention are to provide a drafting instrument for drawing parallel lines, which is of simple construction, has a minimum number of parts, easy to assemble, easy to operate, inexpensive to manufacture, light in weight, durable, efficient and effective in use.

For a better understanding of the invention reference may be had to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a top plan view of the drafting instrument constructed according to one form of the invention and utilizing an arched spring for effecting the advancing movement of the drawing edge arm.

FIG. 2 is a longitudinally side elevational view of the instrument.

FIG. 3 is an end elevational view of the instrument as viewed on line 3—3 of FIG. 1.

FIG. 4 is an enlarged fragmentary sectional view of a portion of the spring actuating mechanism and taken on line 4—4 of FIG. 1.

FIG. 5 is an enlarged transverse sectional view of the laterally extending drawing edge arm and the measuring slide associated therewith.

FIG. 6 is a top plan view of the parallel line drafting instrument constructed according to another form of the invention.

FIG. 7 is a longitudinally extending side elevational view of the instrument.

FIG. 8 is an enlarged fragmentary sectional view of one of the supporting wheels as viewed on line 8—8 of FIG. 6.

FIG. 9 is a fragmentary sectional view of another one of the three supporting wheels provided upon the main head part as viewed on line 9—9 of FIG. 6.

FIG. 10 is a transverse sectional view of the drawing edge as viewed on line 10—10 of FIG. 6.

Referring now particularly to FIG. 1 to 5, 15 represents generally the drafting instrument constructed ac-

cording to the one form of the invention and which comprises generally an enlarged head part assembly 16 to which a laterally extending drawing edge arm 17 is rigidly attached and within which is a slidable centrally located grip member 18 that is advanced to the right as viewed in FIG. 1 by depressing an arched work spring assembly 19 wherein the slide 18 in its advanced position will grip a table surface and as the spring assembly 19 is released after being depressed and with the opposite end of the spring assembly being connected to the head assembly 16 at 21 will cause the head assembly 16 and the laterally extending drawing edge arm 17 carrier by it to be advanced a predetermined measured distance each time the spring assembly 19 is depressed by its thumb button 22. The head assembly 16 comprises two parallel members 23 and 24 laterally spaced from one another and between which the slide 18 is longitudinally worked. These parallel members 23 and 24 are held in lateral spaced relationship by three parallel transversely extending bars 26, 27 and 28.

The arched spring assembly 19 is anchored to the head assembly 16 upon the transverse member 28. In a manner as best seen in FIG. 4. This anchoring of the spring assembly 19 is effected through a bracket plate 29 fixed by rivets 31 to a top plate 32 which is in turn secured to the transverse member 28 and to a bottom member 33 upon the bottom face of which is a pad 34 by which the head assembly 16 will tend to be kept in place until the under face of the head assembly 16 is lifted by a plastic roller 36 that is normally depressed by the action of the arched spring 19 when the arched spring is free from being depressed itself by the thumb upon button 22.

The forward ends of the top and bottom members 32 and 33 assembled upon the transverse member 28 are bifurcated respectively at 32' and 33' so as to accommodate the roller 36.

Extending upwardly from the bracket member 29 are spaced projections 37 on the upper ends of which is a pin 38 on which a bell crank arm 39 is pivoted. The laterally extending arm of the bell crank 39 has depending projection 41 to the lower end of which the roller 36 is journaled by pivot pin 42.

The vertically extending arm of the bell crank lever 39 has projections 43 between which a block 44 is pivotally connected by a pivot pin 45 and to which one end of a notched spring 46 is held in a grip-like manner. The adjustable slide 18 is rearwardly stopped by its end engaging bifurcated projections 33' of the bottom member 33 as can best be seen in FIG. 4. As the arched spring assembly 19 is depressed, the slide 18 is advanced and at this time the roller 36 is lifted and the fixed head parts are held against advance by the friction pad 34. The forward end of the arched spring 46 is gripped by a block 47 that is pivotally connected to a bell crank 48 by a pivot pin 49. The bell crank 48 is pivotally connected by a pin 51 to spaced projections 52 extending upwardly from a roller support member 43 from which projections 54 depend.

A lift roller 55 of plastic is journaled to the projections 54.

The roller support member 53 is fixed to a plate 56 that has bifurcations 56' between which the projections 54 and the roller 55 extend. This plate member 56 is connected as seen in FIG. 3 by a lift plate 57 that is in turn connected to the forward end of the slide 18. The slide 18 is formed of bendable material and is held in

place between the parallel members 23 and 24 by a transverse member 58 having an inclined edge 58' and by rivets 59 whereby to keep the slide 18 from separation from the underface of the head assembly 16 and which also serves by its plate rear edge 58'' engaging with the forward edge of the transverse member 27 as the slide 18 is held in place by a friction pad 61. FIG. 3, upon the arched spring assembly 19 being released.

It should be apparent at this point that as the arched spring assembly 19 is depressed, roller 55 permits forward travel of the slide 18 effected by the tendency to straighten the already bowed spring 46 and at the same time the rear roller 36 is lifted so that the main outer parts 23 and 24 of the head assembly 16 are gripped by pad 34. The slide 18 upon depressing the spring assembly 19 thus moves outwardly and forwardly and to the right as viewed in FIG. 1 upon roller 55 and upon release of the spring 46 the roller 36 is automatically depressed to lift the main body of the head assembly 16. Each time the spring assembly 19 is depressed the slide 18 is advanced and upon being released the main body of the head assembly 16 is brought forwardly to an inclined edge 62 of a laterally adjustable measuring slide 63 that is adjustable in a groove 64 having dovetail connection with the side digits of the slide 63 at 65 and 66, FIG. 5. This slide 63 is frictionally retained by the dovetail connections 65 and 66 so that it can be adjusted and held in place relative to a fixed indication 67 on the upper face of the laterally extending drawing edge arm 17. The slide 63 has a measuring scale 68 so that the slide can be adjusted to any predetermined desired spacing for the lines to be drawn up to one-fourth of an inch. As shown in FIG. 1, slide 63 is at a zero position but upon moving the slide 63 outwardly the inclined edge 62 will be lifted from the inclined edge 58' of the transversely extending slide member 58. A thumb or finger button 69 is used to facilitate a lateral adjustment of the slide 63.

In use, this drawing instrument is placed so that its head assembly 16 will have its end edge engaged with a vertically extending straight edge or even a horizontally extending straight edge depending upon the direction in which the parallel lines are to be drawn and after making a line across edge 17' of the transverse extending arm 17, the spring assembly button 22 is depressed to elongate its spring 46 and to extend the slide 18 to the right as viewed in FIG. 1 and upon release of the spring the rear portions of the head assembly 16 are lifted by the roller 36 so as to allow the main body of the head assembly 16 and the laterally extending arm 17 to be advanced upon its wheels 36 while the pad 61 on the forward end of the assembly and upon the slide will hold the slide in its newly adjusted position. Thereafter, upon release of the arched spring assembly 19, the main body of the head assembly 16 is pulled forwardly by the spring 46 until the forward edge of the transverse bar 27 engages the edge 58'' of the transverse member 58 attached to the slide 18. In FIG. 1, the slide 63 is at zero and there cannot be any measured movement between the parts since the edges 62 and 58' are joined together. By moving the slide 63 outwardly from the head assembly 16 a gap will be provided between the edges 62 and 58' to allow movement of the slide 18 forwardly and thereafter upon release of the spring movement of the main body of the head assembly 16 so that the edge of the transverse bar 27 thereof comes into engagement with the parallel edge

58'' of the slide transverse bar 68. This movement can be repeated any number of times and on each advance a line can be drawn across the edge 17' so that the result can be any number of parallel lines and such lines can be used for lettering or cross-hatching.

In other words, the head assembly 16 is made to creep in caterpillar fashion to bring the transverse edge 17' to different levels for the making of parallel lines with a pencil. The slide 18 is first advanced by the depressing of the spring 46 and thereafter the main body of the head assembly 16 is brought up to the position of the slide.

Referring now particularly to the form of the invention shown in FIGS. 6 to 10, 70 represents generally the drawing instrument which comprises generally a head assembly 71 with a slide 72 movable forwardly with respect thereto and extending laterally from the head assembly 71 is a laterally extending drawing edge arm 73 having pencil drawing guide edges 73' and 73'' on the opposite sides thereof.

The head assembly 71 comprises two parallel transversely spaced side members 74 and 75 held in spaced relationship by two transversely extending forward and rearward bar members 76 and 77. The slide 72 operates in the space between the parallel members 74 and 75.

The slide 72 is held in place between the parallel members 74, 75 by a transversely extending member 78 having an inclined edge 78' that engages as the slide 72 is moved forwardly with a cooperating inclined edge 79 of a transversely extending slide 81 held in a dovetail manner in a groove 82 and can be adjusted to vary the distance 83 between the inclined edge 78' of the transverse member 78 and the parallel inclined edge 79 of the slide 81. The slide 81 has an elongated closed end slot 83 upwardly into which there extends from the bottom of the laterally extending drawing edge 73, a flat headed screw 84 on which there is threaded a turn knob 85 that will clamp the slide 81 in any adjusted position along the slot 83. A square knob 86 extends upwardly from the transverse slide 81 that can be used to effect the adjustment of the slide 81 in the transversely extending drawing edge arm 73. The slide 81 fits into the drawing edge arm 73 in a dovetail manner as best seen in FIG. 10.

The slide 72 has a forwardly extending central projection 87 that is bifurcated at its outer end to accommodate a roller 88 that is journaled on a tin 89 extending between the bifurcations and held against rotation in one direction by a forwardly extending flat spring 91 secured to the underside of the forwardly extending member 87 and the slide 72 by a rivet 92. The forward end of the spring 91 engages the surface of the roller 88 to prevent its clockwise rotation as viewed in FIG. 8. The roller 88 is formed of rubber-like material so as to have a friction grip engagement with the table surface. So as to hold the slide in place as the main body of the head assembly 71 with the members 74 and 75 are later brought up to the position of the slide 72. When the slide 72 is advanced the roller 88 is held against rotation by the spring 91 but the roller 88 can freewheel as the instrument is rolled downwardly over a table surface.

On the respective side members 74 and 75 at their trailing ends are similar rubber-like rollers 93 and 94 laterally spaced from one another and respectively journaled in slots 96 and 97 provided respectively in

the trailing ends of the respective parallel head members 74 and 75. A leaf spring 98 is secured by rivets 99 to the top of the transverse bar 77 and its trailing end engages with the surface of the roller 94 to prevent rotation in a clockwise direction as best seen in FIG. 9. A leaf spring 101 is secured by rivets 102 to the transverse member 77 and the parallel body member 75 and will likewise prevent clockwise rotation of the roller 94. The roller 94 is journaled on a pivot pin 103 retained upon the upper surface of the parallel head member 75 by a bearing block or plate 104, underlying the spring 101 and adhered to the top surface of the member 75. The roller 93 is similarly retained on a pin held in place by a bearing block or plate 106 underlying the leaf spring 98.

In the forward and advancing movement of both the slide 72 and the members 74 and 75 that carry the transversely extending arm 73 the rollers 88, 93 and 94 are restrained against rotation by their respective springs but upon rearward movement of the instrument from its advanced position the rollers can freewheel in unison to easily uncover the lines which have been made along either of the pencil guide edges 73' or 73'' of the laterally extending arm 73.

To use the instrument, the head assembly 71 is placed along a guide edge so that the outer edge of the parallel head member 74 can be worked against this edge. The thumb and fingers of the left hand of the user are placed so that the thumb can engage the rear transverse bar 77 of the main body of the head assembly 71 and a forefinger engage the transversely extending inclined edge retaining member 78 of the slide 72 and with this finger while the thumb is retaining the spaced body members 74 and 75 against movement, the forefinger will force upwardly or forwardly the slide 72 against the friction of the roller 88. The inclined edge 78' of the slide member 78 will be brought upwardly against the inclined edge 79 of the transverse arm slide 81. Thereafter the thumb will force upwardly the joined head members 74 and 75 by acting upon the rear transverse bar 77 and until a stop edge at the inner end of the transverse slide groove 82 will come to rest against the transverse edge 78'' of the inclined edge transverse member 78 secured to the top of the slide 72. The ends of transverse member 78 overlap respectively the parallel body members 74 and 75 to hold the slide 72 against downward displacement from its sliding engagement with the inner edges of the parallel members 75 and 74.

Thus in step by step fashion the drawing edge 73' of the arm 73 can be advanced measured in equal distances depending upon the setting of the slide 81 on the transversely extending arm and the distance 83 between the inclined edge 79 thereof and the inclined edge 78' of the transverse member 78. The slide 72 is thus first moved to establish the new line position and thereafter the main head body member 74, 75 with the transversely extending arm 73 is moved by the thumb to bring the same upwardly or forwardly to the new drawing line position. This operation is effected repeatedly until the full desired number of lines have been drawn upon the paper sheet. With this second form of the invention the operation is effected by the two movements of the forefinger and the thumb of the left hand whereas with the first form of the invention the only action needed is the depressing of the arched spring to advance the slide and establish the new posi-

tion but thereafter upon release of the spring the main body of the head assembly and the transversely extending drawing edge arm is effected by the drawing together of the ends of the arched spring upon the same being released with the trailing end of the arched spring of this first form of the invention pulling upwardly and forwardly the main head body and the transverse arm.

While various changes may be made in the detailed construction of this drawing instrument, it shall be understood that such changes shall be within the spirit and scope of the present invention as is defined by the appended claims.

What is claimed is:

1. A drafting instrument for drawing parallel horizontal lines comprising a head assembly having laterally spaced parallel guide members, a head slide longitudinally adjustable between the parallel guide members, said head slide having a transversely extending guide member fixed to the upper face thereof and having a forward inclined edge, a transversely extending drawing edge arm extending laterally and rigidly at a right angle from one of the parallel guide members and having a transversely extending guideway therein, a transversely extending measuring slide adjustable in the guideway of the transversely extending drawing edge arm and having an inclined stop edge that extends over the head assembly to confront the forward inclined edge of said transversely extending guide member and which can be set by transverse adjustment to a measured distance from the inclined edge on the transversely extending guide member on the head slide to allow for an advanced measured movement of the head slide and its transversely extending guide member in the parallel head guide members and thereafter said parallel head guide members and the transversely extending arm being made free to advance to the new position established by the head slide and its transversely extending guide members whereby parallel line drawing can be made over the drawing edge of the transversely extending arm when the head assembly slide and the parallel guide members of the head assembly with the transversely extending arm are advanced in sequence to one another and in a step by step manner.

2. A drafting instrument for drawing parallel lines as defined in claim 1, a supporting roller device depending from the forward end of the head slide and supporting roller means depending from the rear end of the main body of the head assembly.

3. A drafting instrument for drawing parallel lines as defined in claim 1 and a longitudinally extending arched spring connected between the forward end of the head slide and the rearward end of the main head body, whereby upon depressing the spring intermediate its length thereof the head slide will be advanced to establish a new location and upon release of the spring and the retaining of the slide in its advanced location the spring will pull forwardly the spaced parallel members and the transversely extending arm to a new location for the drawing of a new line.

4. A drafting instrument for drawing parallel lines as defined in claim 2, and said head slide supporting roller device including a bell crank pivoted thereon with the roller journaled on a forwardly extending arm of the bell crank and the other arm of the bell crank extending upwardly, the wheel supporting means connected to the main head body members at the rear of the head assembly including a bell crank with a forwardly ex-

tending arm to which the roller is journaled, said latter bell crank having an upwardly and rearwardly extending arm and an arched spring having its ends pivotally connected between the upwardly extending arms of the bell crank for the supporting rollers, whereby as the arched spring is depressed the slide roller is placed in engagement with the table surface or paper thereover and simultaneously the main body roller is lifted, the release of the spring places the rear one being depressed serving to release the friction pads from the table or paper surface to thereby permit easy movement of the slide and the main head body thereover.

5. A drafting instrument for drawing parallel lines, as defined in claim 4 and a transverse bar extending between the parallel spaced head members and said transverse bar carried on the head slide having a stop edge engageable with the transverse bar extending between

the parallel head members to limit the return movement of the slide and the spring.

6. A drafting instrument for drawing parallel lines, as defined in claim 2, and said slide roller device being formed of frictional material and a spring stop member for limiting the forward movement of this slide by its engagement with the table surface and said roller means on the main head body including two rollers one located on each laterally spaced parallel head member and members engaging the main body rollers to hold them against rotation in a forward direction, the rollers of both the head slide and the main body being adapted to freewheel upon retracting the overall movement of the instrument and when the instrument is taken out of use.

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