

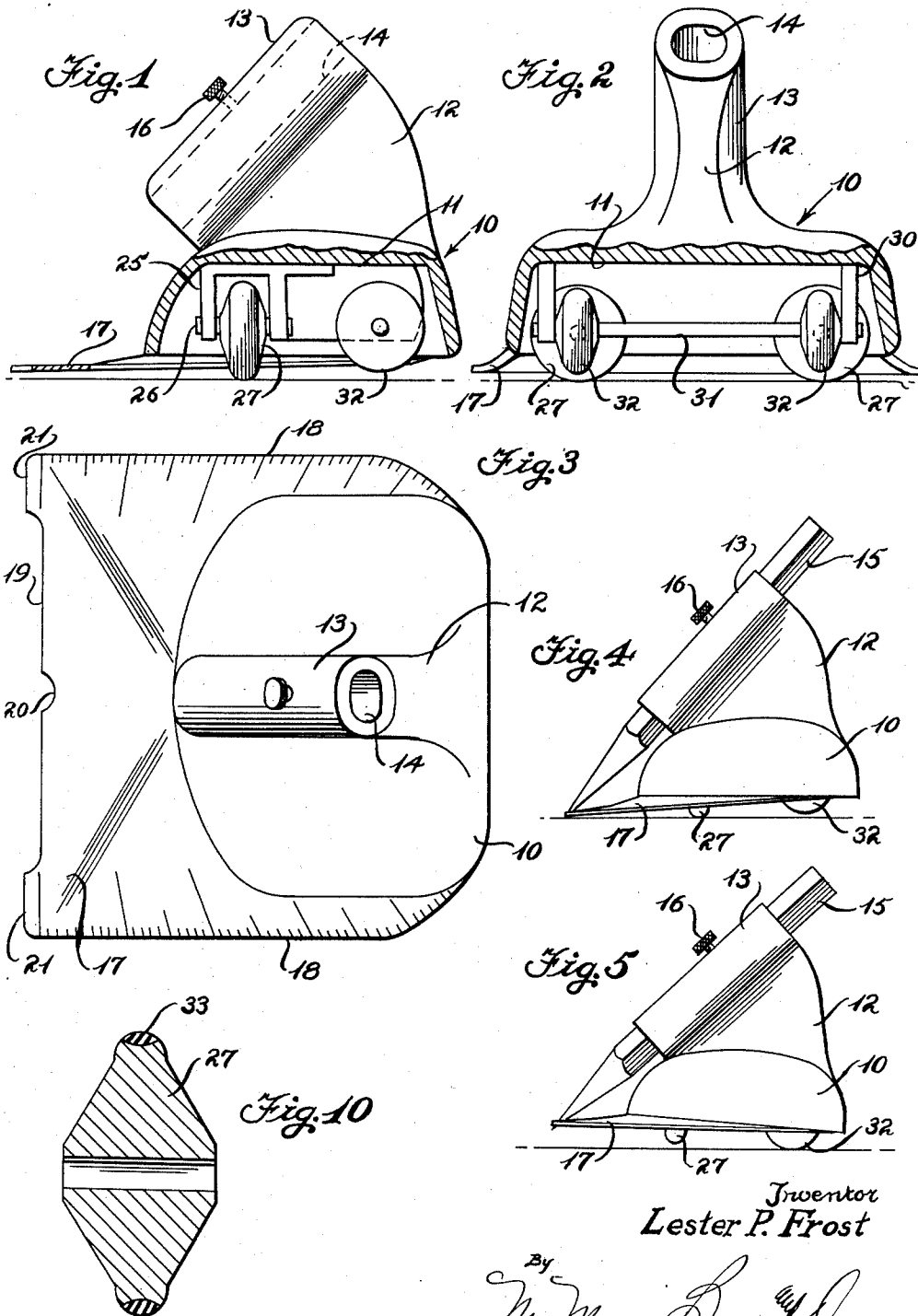
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L. P. FROST
DRAFTING INSTRUMENT

2,543,009

Filed Aug. 20, 1946

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

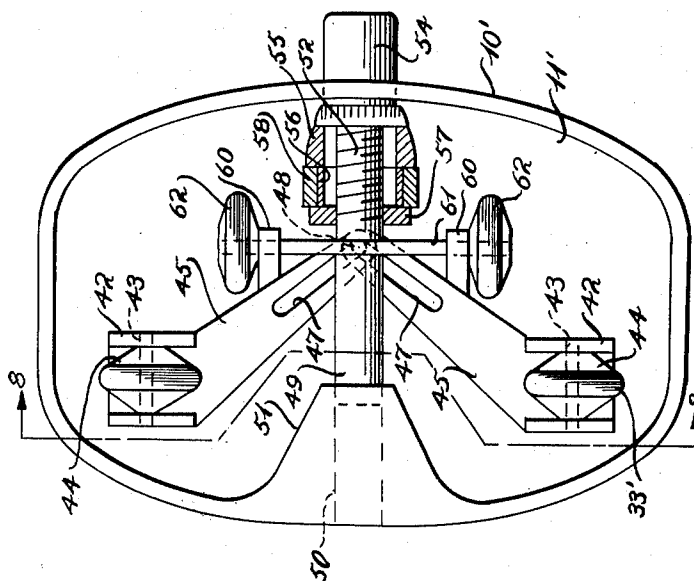


Fig. 7

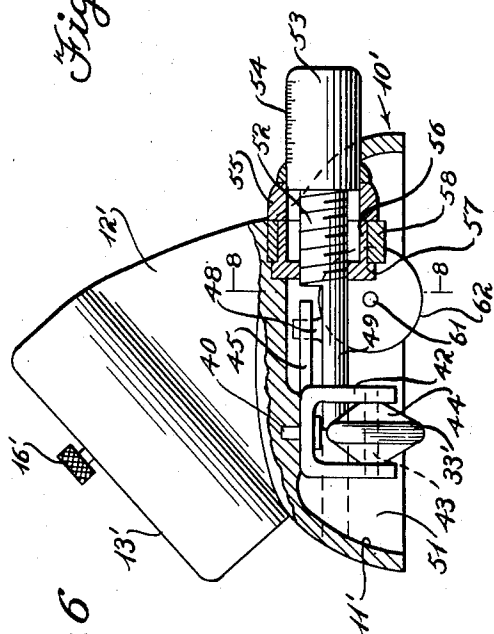


Fig. 6

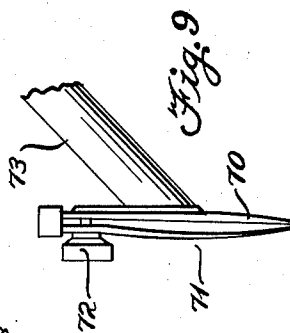


Fig. 9

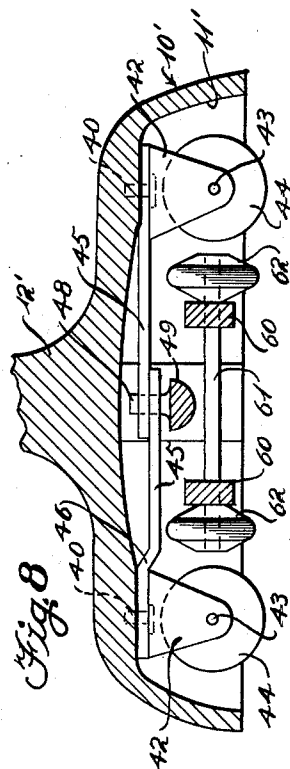


Fig. 8

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DRAFTING INSTRUMENT

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2 Claims. (Cl. 33—26)

1

This invention relates to a drafting instrument, and more particularly to an instrument adapted to be utilized with a scribing or writing instrument for drawing straight or curved lines.

A primary object of this invention is the provision of a device adapted to facilitate the drawing of straight lines of any length, and further, to facilitate the drawing of a plurality of parallel straight lines, or lines at an angle to a given base line.

An additional object of the invention is the provision of an instrument adapted to facilitate the drawing of arcs of any radii in an accurate and expeditious manner.

Still another object of the invention is the provision of such a device which may be readily adapted to a variety of drafting purposes, which is sturdy and durable in construction, reliable and efficient in operation, and relatively simple and inexpensive to manufacture and utilize.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter, and disclosed in the accompanying drawings, wherein there are shown preferred embodiments of this inventive concept.

In the drawings:

Figure 1 is a side view, partially in elevation and partially in section, showing one form of device embodying features of the instant inventive concept.

Figure 2 is a rear view partially in elevation and partially in section of the device shown in Figure 1.

Figure 3 is a top plan view of the device.

Figure 4 is a reduced side elevational view of the device shown in association with a drawing pencil in one position of adjustment.

Figure 5 is a view similar to Figure 4, but showing a different position of adjustment.

Figure 6 is a side view partially in elevation and partially in section showing a modified form of construction.

Figure 7 is a bottom plan view of the device of Figure 6.

Figure 8 is a sectional view taken substantially along the line 8—8 of Figure 7, as viewed in the direction indicated by the arrows.

Figure 9 is an enlarged elevational view of a constructional detail.

Figure 10 is an enlarged sectional view taken through one of the supporting wheels of the device.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Having reference now to the modification disclosed in Figures 1 to 5, inclusive, there is generally indicated at 10 a base member having a recess or aperture 11 therein which may be called

2

a hollow base member. An upwardly extending arcuate flange 12 supports an angularly disposed cylindrical member 13 provided with a bore 14 inclined downwardly toward the front of the base 10.

The bore 14 is adapted for the accommodation of a pencil 15, as best shown in Figures 4 and 5, or other desired implement which may take the form of a pen, a brush, a scribe, or the like, which instrument is adapted to be held in position within the bore, as by means of a set screw 16, or any other suitable retaining means.

An index plate 17 is adapted to be positioned about the lower extremity of the base 10 and includes parallel straight sides 18 provided with suitable indicia indicative of angles, as well as a straight front side 19 provided with a depression 20 into which the point of a pencil 15 or the like is adapted to fit in such manner that the point is in perfect alignment with the indicia zero corresponding to the edge 19. The edges of the plate are extended, as at 21, to provide for such zero indicia.

Positioned within the recess 11 in the base 10 and on opposite sides thereof are spaced pairs of aligned depending lugs 25, each pair supporting an axle 26 upon which is mounted a wheel 27. The lugs 25 are positioned substantially adjacent the forward end of the base 10. Rearwardly of the lugs 25 within the recess 11 and on opposite sides thereof are depending lugs 30 which support an axle 31 extending transversely across the recess substantially at right angles to the axle 26.

The axle 31 supports adjacent the opposite extremities thereof wheels 32 of slightly lesser diameter than the wheels 27. It will thus be seen that a line generated by the rotation of a wheel 32 will be at exactly right angles to that generated by the rotation of a wheel 27, and vice versa.

As best shown in Figure 10, both the wheels 27 and 32 are provided about their peripheries with tires 33 of suitable non-slipping material, such as rubber or the like.

From the foregoing the operation of the device should now be understandable. A pencil or other instrument is first adjusted in such manner that the tip extends into the recess 20 in the forward edge 19 of the index plate, and the body of the instrument is then grasped in the same manner as a pencil, the fingers embracing the upwardly extending member 12. The instrument is then placed down on the material to be marked so that all the wheels 27 and 32 rest on the paper, in which position movement of the device is difficult. If it is desired to draw a straight line, the body is tipped forwardly, as shown in Figure 4, until the pencil point contacts the paper, thus raising the wheels 32 with the device resting on

3

the wheels 27, thus leaving the instrument free to travel in a transverse direction. After the line is drawn, if it is desired to draw a parallel line, the body may be tipped back until it rests on the wheels 32 and the instrument moved a desired distance from the base line. When this position is reached, the body may be then tipped forward off the wheels 32 and a second line drawn parallel to the first.

In drawing a right angle, the instrument may be lifted free of the paper and placed down so that one of the sides 18 of the index plate 17 is aligned with the base line, and a line perpendicular to the base line drawn in the manner hitherto described. Any angled line to the base line may be drawn by placing the instrument down so that the appropriate angled indicia of the index plate overlies the base line, whereupon an angle line may be drawn in the manner previously described.

A modified form of construction, which may be not only utilized in the manner previously described, but also for drawing curves of relatively large radii is disclosed in Figures 6 to 8, inclusive.

This modification comprises a base 10' substantially identical in configuration to base 10 having an interior recess 11' which may be called a hollow base member, a flange 12', a tubular portion 13', including an interior channel, and a set screw 16' for holding a pencil or similar instrument in the bore.

Although not essential to the use of this device, an index plate conforming in configuration to index plate 17, may be utilized if desired.

Pivotally mounted, as on pivots 40, on opposite sides of the recess 11' adjacent the front end thereof are a pair of brackets 42, each of which carries an axle 43 upon which is rotatably mounted a wheel 44 corresponding in general configuration and size to the previously described wheel 27, and provided with tires 33' similar in configuration thereto. Fixedly secured to each of the brackets 42 adjacent the pivot point thereof is an arm 45 which extends rearwardly and inwardly, the extremities of the two arms being adapted to overlie each other at substantially the center line of the base. As best shown in Figure 8, one of the arms 45 may be provided with an offset 46 in order to permit the overlying of the extremities above mentioned. The extremity of each arm 45 is provided with an elongated slot 47 and a pin 48 carried by a semi-cylindrical member 49 extending longitudinally of the base member 10' is adapted to extend into both of the slots 47.

One end of the semi-cylindrical member 49 extends into a corresponding aperture 50 in a boss 51 extending inwardly from the front wall of the body 10'. The opposite end of the guide member 49 comprises an integral portion of a cylindrical threaded member 52 which terminates in an enlarged cylindrical stub end 53 provided with graduations 54 thereon. A turning nut or rotatable element, comprised of a finger-engaging portion 55, a flange 56, and an annulus 57 surrounds the portions 52 and 53, the annulus 57 being provided with a centrally positioned threaded aperture engaging the threads of the member 52. Flange 55 is held in position by a supporting ring 58 carried by the body 10' interiorly of the recess 11', it being pointed out that the body is so constructed that the stub end 53, as well as the upper portion of the turning nut 55, extends exteriorly of the body.

From the foregoing it will now be seen that

4

rotation of the turning nut 55 causes linear movement, through the threaded portion 52, of the semi-cylindrical member 49, and hence the pin 48. Movement of the pin 48 in turn moves the arms 45 to cause rotative movement of the brackets 42 about their associated pivots 40. Obviously, the degree of rotative movement may be designated by the indicia 54, and, since the wheels obviously are turned in opposite directions by such movement, the result defines an arc, the radius of which may be readily varied by appropriate adjustment of the nut 55.

The recess 11' also carries a pair of depending brackets 60 which carry an axle 61 on the extremities of which are supported wheels 62, the wheels 62 being positioned at substantially right angles to the position of the wheels 44 when the latter are in aligned relation. The function of the wheels 62 is obviously identical to that of the previously discussed wheels 32.

In the modification above just described, it will be understood that with the wheels 44 in aligned relationship, the device may be utilized in a manner identical to that described in connection with the foregoing modification. However, when the wheels 44 are positioned in such manner that their path of travel forms an arc, it will be readily apparent that wide radius curves may be readily drawn simply by grasping the device in the manner similar to that discussed in connection with the previous modification, and tilting the device forwardly in such manner that the wheels 62 are clear of the paper or other surface.

While in the foregoing a pencil has been described as particularly applicable for use with the device, a special type pen, as disclosed in Figure 9, may be also utilized for inking if desired. The pen comprises a straight point 70 and a bow point 71 of conventional design, as well as the customary adjusting nut 72. To the outer side of the straight point 70, a cylindrical shank 73 may be affixed set at an angle corresponding to the angle of the bore 14, in such manner that the point is substantially perpendicular to the paper. Obviously, any other desired instrument may be utilized if desired.

From the foregoing it will now be seen that there is herein provided an improved drafting instrument which accomplishes all the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. In a drafting instrument, a hollow base member, a pair of horizontally disposed arms converging toward each other at one end and positioned within said base member, a horizontally disposed guide member extending longitudinally of said base member positioned below and spaced from said arms and mounted on said base member for linear movement, one end of said guide member projecting beyond and terminating at a point exteriorly of said base member; a cylindrical stub provided with graduations thereon fixedly mounted on the projecting end of said guide member, each of said arms adjacent the converging end being provided with a longitudinally extending slot, a vertically disposed pin on

5

said guide member and slidably engaging the slots in the converging ends of said arms, a wheel mounted for rotation about a horizontal axis positioned generally longitudinally of said base member adjacent to and below each of the other ends of said arms and operatively connected to the other end of said arm for movement about a vertical axis, a transversely disposed rotatable axle positioned within said base member below and spaced from said guide member and dependently supported from said base member, a wheel positioned adjacent each end of said axle and fixedly secured thereto, said guide member being provided with a threaded portion extending inwardly from said stub and terminating at a point adjacent to and spaced from said pin, and a rotatable turning nut in threaded engagement with the threaded portion of said guide member for effecting the linear movement of the latter.

2. In a drafting instrument, a hollow base member, a pair of horizontally disposed arms converging toward each other at one end and positioned within said base member, a horizontally disposed guide member extending longitudinally of said base member positioned below and spaced from said arms and mounted on said base member for linear movement, one end of said guide member projecting beyond and terminating at a point exteriorly of said base member, a cylindrical stub provided with graduations thereon fixedly mounted on the projecting end of said guide member, means slidably connecting each of the converging ends of said arms to said guide

6

member, a wheel mounted for rotation about a horizontal axis positioned generally longitudinally of said base member adjacent to and below each of the other ends of said arms and operatively connected to the other end of said arm for movement about a vertical axis, a transversely disposed rotatable axle positioned within said base member below and spaced from said guide member and dependently supported from said base member, a wheel positioned adjacent each end of said axle and fixedly secured thereto, and a rotatable element operatively connected to the portion of said guide member inwardly of said stub for effecting the linear movement of said guide member.

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