Sept. 2, 1969 J. R. JOHNSON 3,464,117

PERSPECTIVE DRAFTING DEVICE

Filed June 11, 1968 3 Sheets-Sheet 1

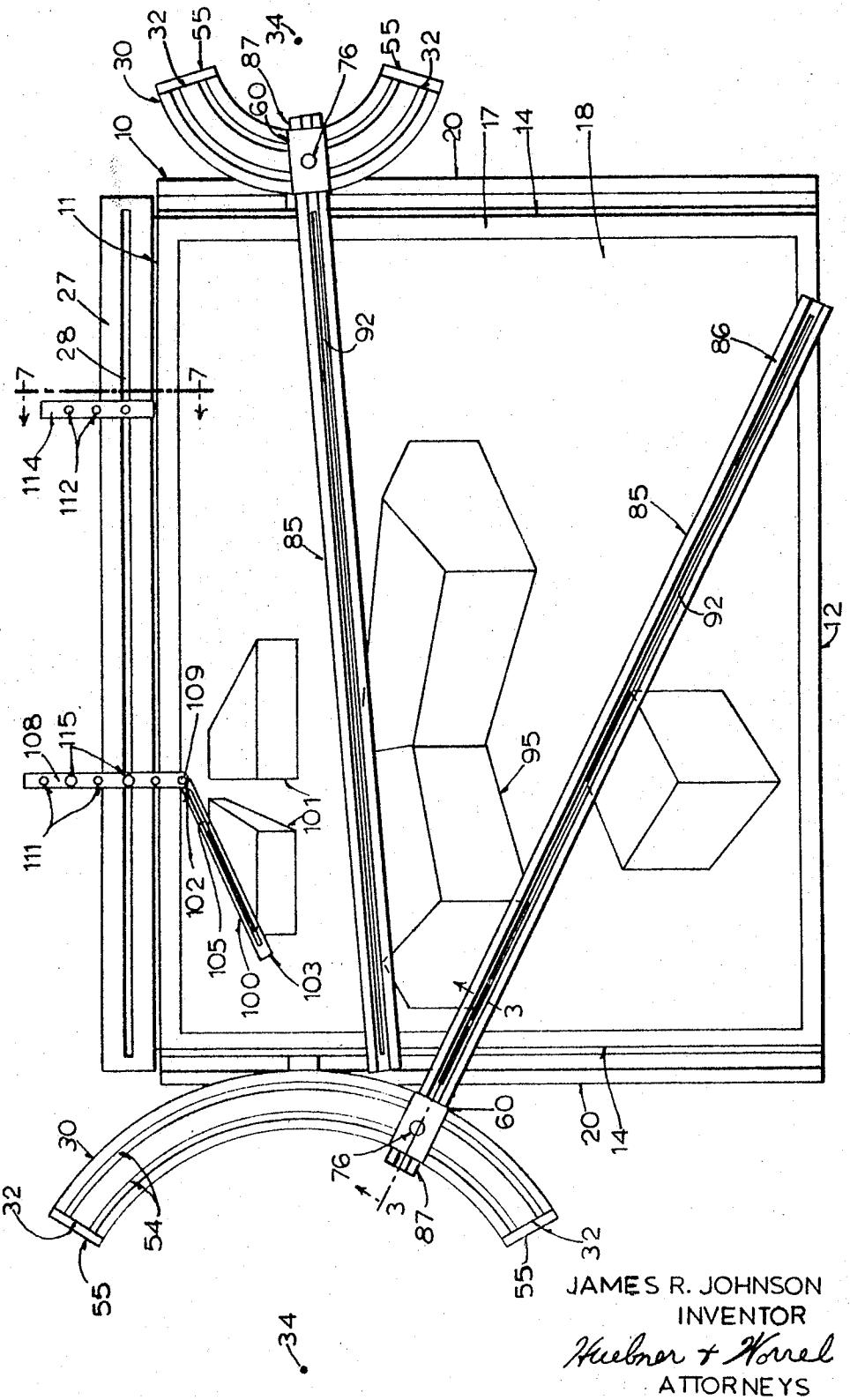


FIG. 1.

JAMES R. JOHNSON
INVENTOR

Huebner & Worrel
ATTORNEYS

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PERSPECTIVE DRAFTING DEVICE

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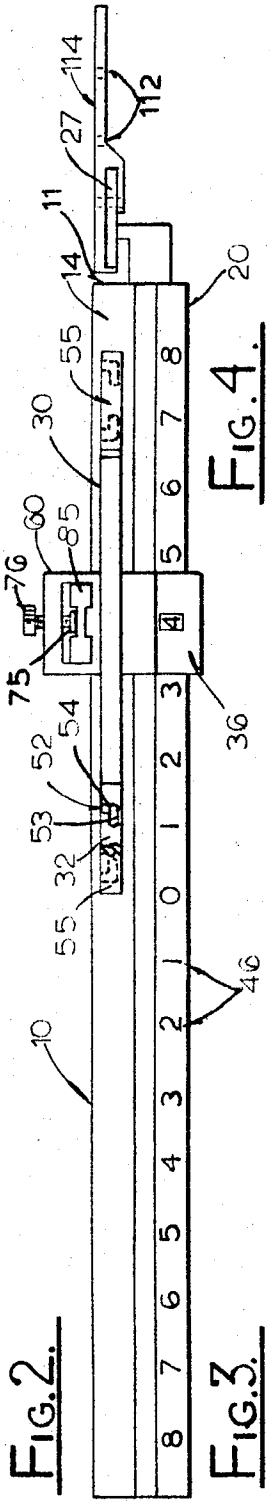


FIG. 2.

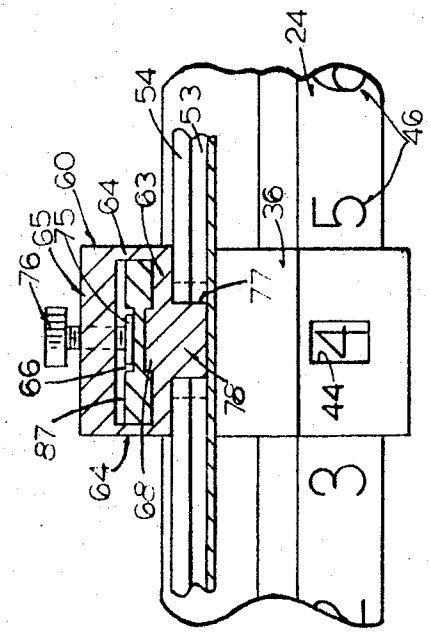


FIG. 4.

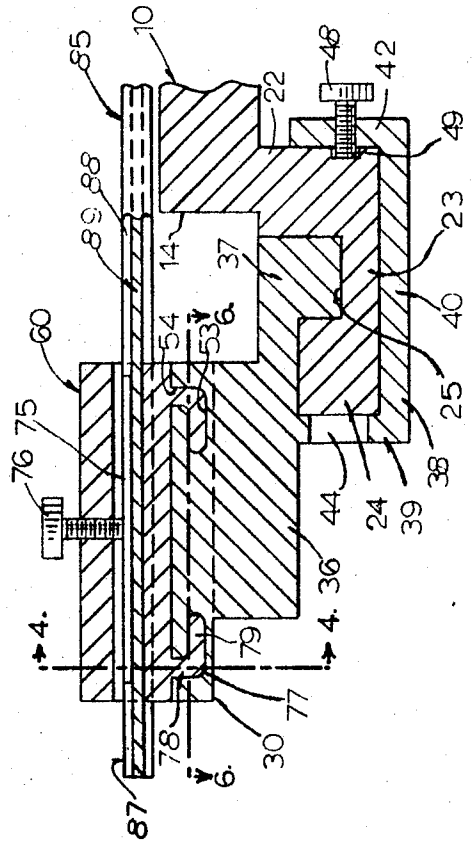


FIG. 3.

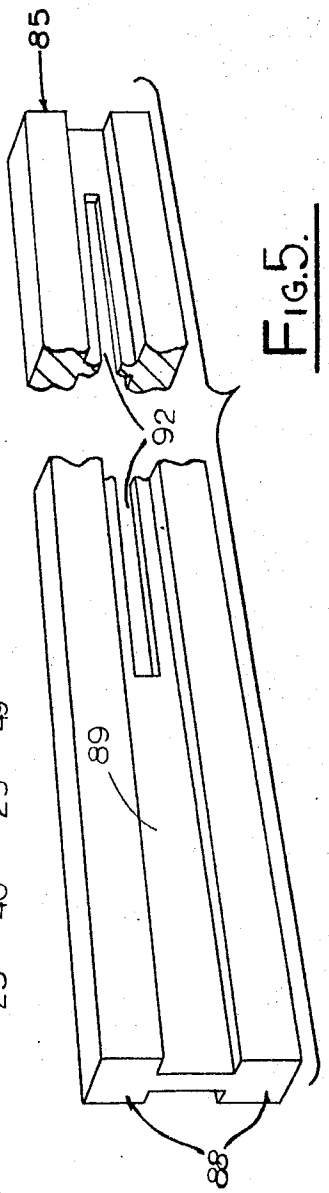


FIG. 5.

JAMES R. JOHNSON
INVENTOR
Haelner & Horel
ATTORNEYS

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PERSPECTIVE DRAFTING DEVICE

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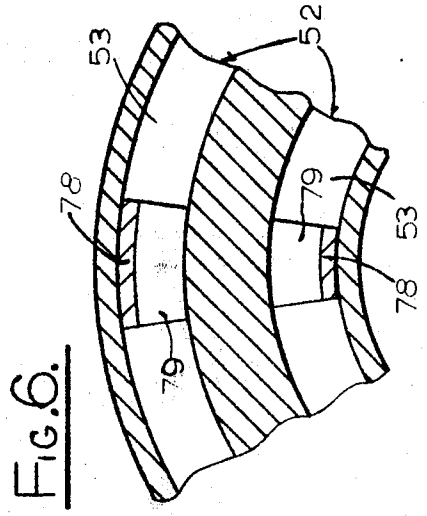


FIG. 6.

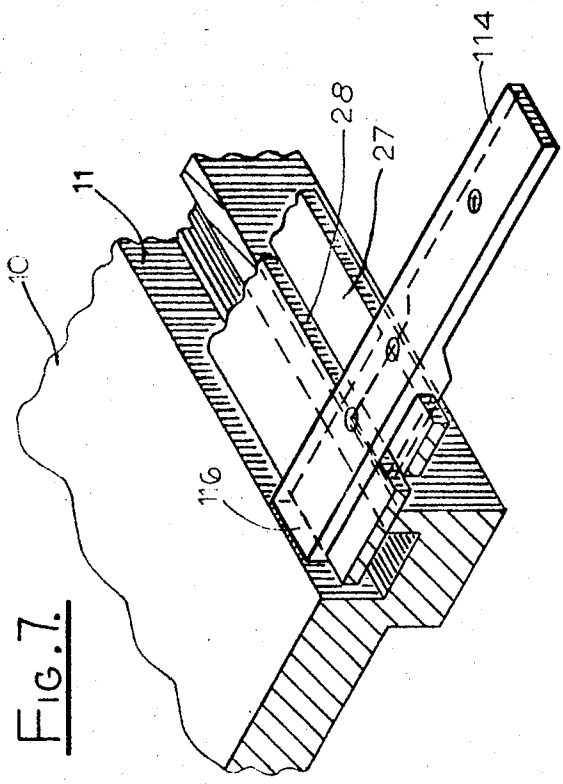


FIG. 7.

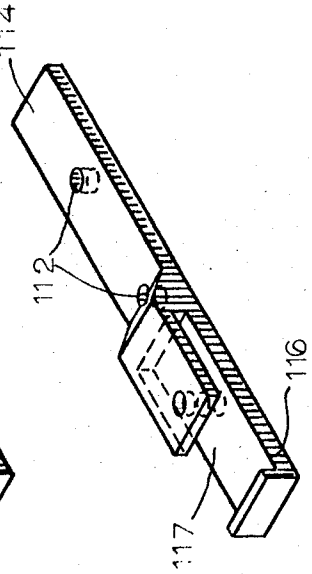


FIG. 8.

JAMES R. JOHNSON
INVENTOR
Huebner & Worel
ATTORNEYS

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3,464,117

PERSPECTIVE DRAFTING DEVICE

James R. Johnson, 1554 N. 4th St., Fresno, Calif. 93703

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Int. Cl. B43l 13/14
U.S. Cl. 33—77 6 Claims

ABSTRACT OF THE DISCLOSURE

A perspective drafting dveice providing a substantially flat board having marker guide means disposed in superimposed relation thereon and arcuate support means mounting said marker guide means for movement through an arcuate path providing a variety of selectively adjusted positions on the board with the support means having a locus constituting a vanishing point for said marker guide means spaced outwardly from the support means and from the board with the marker guide means being precisely aligned with said vanishing point in all said adjusted positions.

CROSS REFERENCE TO RELATED APPLICATIONS

The present invention relates generally to the subject matter disclosed in my copending U.S. patent application, Ser. No. 652,134, filed July 10, 1967, now Patent No. 3,389,470 and entitled Drafting Device for Constructing Perspective Drawings.

BACKGROUND OF THE INVENTION

The structure disclosed in my above designated copending application is particularly effective for constructing either one-dimensional or two-dimensional drawings. Where the longer side of the object under construction requires a vanishing point disposed a substantial distance from the drawing such construction is not limited by the size of the board or by the particular location of the object under construction of the board. As previously described in my copending application, in some instances, such vanishing point may be disposed completely off the board which ordinarily precludes the desired construction of that side of the figure with any degree of precision. Although the drafting device disclosed in my copending application successfully overcomes such problems and constitutes a highly meritorious advance over the prior art devices, it has been found that certain modifications therein are desirable, particularly, when the available space for locating the drafting board is at a premium. My prior device utilizes a drafting board having an elongated support bar providing opposite ends outwardly spaced from the sides of the board. A pair of elongated marker guide arms are individually pivotally mounted on the opposite ends of the support bar with their respective axes of pivotal movement providing vanishing points for constructing perspective drawings on the board. Accordingly, a substantial amount of space is required outwardly of each side of the board to permit free pivotal movement of the physically located outwardly spaced vanishing points. Furthermore, such structure requires the described components to be constructed of substantially heavier, more rigid material in view of their substantially overhanging condition relative to the board than would be necessary if they could be supported more closely adjacent to the board. Heretofore, it has been impossible to reduce the amount of overhang of the marker guide arms and still locate their vanishing points the desired distances from the board.

Accordingly, it is an object of the present invention to provide an improved perspective drafting device.

Another object of the present invention is to provide

such an improved perspective drafting device which utilizes a drafting board affording a plurality of infinitely adjustable vanishing points for a plurality of marker guide arms both on and off the board.

Another object is to provide a perspective drafting device of the character described in which the vanishing points for the marker guide arms may be located at such remote positions off the board without requiring the marker guide arm to be physically extended and supported at such remote positions.

Another object is to provide a perspective drafting device in which the plurality of marker guide arms are functionally provided with remotely located vanishing points off the board but which are capable of being mounted closely adjacent to the board with a minimum of overhang.

Another object is to provide a perspective drafting device which utilizes arcuately formed supports for adjustably slidably mounting the marker guide arms on the board with the supports having centers or loci individually affording vanishing points for the marker guide arms in outwardly spaced relation from the arms and the supports.

Another object is to provide a perspective drafting device which utilizes a plurality of various sizes of arcuate supports which may be interchangeably mounted on the board for varying the spacing of the vanishing points of the arms from the board.

Other objects and advantages of the present invention will become more clearly apparent upon reference to the following description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a drafting device embodying the principles of the present invention.

FIG. 2 is a side elevation of the drafting device of FIG. 1.

FIG. 3 is a somewhat enlarged fragmentary longitudinal vertical section, taken along line 3—3 of FIG. 1, showing the slidable mounting of the marker guide arms on the arcuate supports of the present invention.

FIG. 4 is a somewhat enlarged fragmentary transverse vertical section through the marker guide arm mounting, taken generally along the line 4—4 of FIG. 3.

FIG. 5 is a perspective view of the marker guide arm with portions removed for illustrative convenience.

FIG. 6 is a somewhat enlarged transverse horizontal section through the guide arm mounting, taken generally along the line 6—6 of FIG. 3.

FIG. 7 is a somewhat enlarged fragmentary perspective of a marker guide blade mounting arm disposed on the top edge of the board.

FIG. 8 is a perspective view of the guide blade mounting arm of FIG. 7 removed from the board.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more particularly to the drawings, the drafting device of the present invention provides a substantially rectangular flat drawing board **10** having opposite top and bottom edges **11** and **12**, respectively, and opposite side edges **14**. The board may be of either laminated or solid construction and has an upper drawing surface **17** for receiving a sheet of drafting paper **18**. As best shown in FIGS. 1, 2 and 3, a pair of in integral elongated guide rails **20** are individually coextensively disposed along each of the sides edges **14** of the board. Each of the guide rails provides a downwardly extended inner leg **22**, a bottom wall **23**, and an outer upwardly extended leg **24** disposed in spaced substantially parallel relation to the inner leg **22** to define therebetween an elongated groove or key slot **25**.

As best shown in FIG. 7, the board **10** further includes an elongated T-bar flange **27** coextensively integrally formed along its top edge **11**. As best shown in FIG. 1, the flange provides a centrally longitudinally extended slot **28** having ends terminating closely adjacent to the side edges **14** of the board. Both the guide rails **20** and the upper T-bar flange **27** may be constructed integrally with the board, as shown, or may be constructed separately and attached in their desired positions by any suitable mounting means such as screws, bolts, or an adhesive.

A pair of elongated arcuately formed, fractionally circular, support bars **30** are individually mounted on the opposite side edges **14** of the board with the edges being substantially tangentially related to the bars. The support bars are identical except for a difference in their respective sizes or degree of curvature. Each of the support bars has opposite angularly disposed ends **32** which are disposed in planes radially extended from a locus point **34** about which the bar extends at a fixed radius. It is noted that the locus point of the support bar on the left side of the board, as viewed in FIG. 1, is spaced a greater distance from the board than the locus point of the relatively smaller support bar on the right hand side of the board.

The support bars **30** are individually mounted for adjustable sliding movement longitudinally along their respective guide rails **20** at the side edges **14** of the board. Such mounting is accomplished by an arm **36** extended from its associated support bar from a point substantially intermediate the opposite ends **32** thereof for sliding engagement with the guide rails. The arms include an upper downwardly extended key member **37** and a lower annular portion **38** providing an outer wall **39**, a lower wall **40**, and an inner wall **42**. The outer wall **39** has an opening **44** therethrough providing a viewing window through which a plurality of spaced numbers **46** on the outer leg **24** of the guide rails **20** are viewable. A locking screw **48** is screw-threadably carried by the inner wall **42** for frictional engagement within an elongated notch **49** in the inner leg **22** of the guide rail for locking the support bar dependably in its desired adjusted position between the top and bottom edges **11** and **12** of the board.

Each of the arcuate support bars **30** provides a pair of radially spaced arcuate channels **52** disposed in conforming relation to the curvature of the bars to define an upwardly disposed arcuate mounting track as best shown in FIG. 3, the channels are substantially L-shaped in cross-section and provide lower inwardly extended horizontal portions **53** and upwardly extended slot portions **54**. The channels extend between the ends **32** of the support bars which individually releasably mount a pair of end plates **55** in blocking relation to the channels.

An arm mounting head **60** is disposed for slidable movement along the arcuate channels **52** of the track on the support bars between the opposite ends **32** thereof. The head provides a substantially rectangular body having a lower wall **63**, spaced substantially parallel upright side walls **64** and a top wall **65** defining therebetween an elongated longitudinally extended substantially horizontal slot **66** through the head. The lower wall provides a centrally disposed longitudinally extended key **68** disposed in inwardly spaced substantially parallel relation to the side walls **64**. An elongated substantially rectangular shoe **75** is positioned within the slot **66** in spaced substantially congruent relation with the key **68** by a screw-threaded adjusting screw **76** screw-threadably mounted through the top plate **68** of the head.

A pair of guide hooks **77** are mounted in integral depending relation from the mounting head in sliding engagement within the channels **52** of the support bar **30**. As best shown in FIGS. 3, 4 and 6, the guide hooks individually include depending legs **78** extended through the slot portions **54** of the channels **52** and substantially right angularly related foot portions **79** slidably disposed within the horizontal portions **53** of the channels. The heads **60** are initially mounted on their respective support bars **30** by endward insertion of their guide hooks into the channels **52** prior to installing the end plates **55**.

A pair of marker guide arms **85** are disposed in superimposed relation on the upper drawing surface **17** of the drawing board **10**. The arms include overlapping inner ends **86** and opposite outer ends **87**. As best shown in FIG. 5, each of the marker guide arms is of substantially I-beam construction in cross section providing opposite outer beams **88** which are interconnected by a relatively thin web **89**. An elongated slot **92** is formed in the web for receiving a suitable marking instrument, not shown for guiding the same during the drafting operation. The arms may be constructed, as shown, in a one-piece molded configuration or they may be laminated with the web being composed of a flexible plexy glass or other clear plastic material sandwiched between the outer beams **88**.

The marker guide arms **85** are constrained in a variety of adjusted angular positions upon the upper surface **17** of the drafting board **10** by extension of their outer ends through their respective mounting heads **60**. As best shown in FIGS. 3 and 4, the outer beams **88** of the arms are extended through the slot **66** in intimate slidably embracing relation to the key **68** on the lower wall **63** of the head. The arm is positively held in its desired longitudinally adjusted position in the head by the shoe **75** frictionally engaging the upper surface of the web **89** of the arm in tightly clamping relation by manipulation of the tightening screw **76**. It will be noted that the marking instrument receiving slot **92** in each of the arms is disposed in longitudinally aligned relation with the locus **34** of its respective support bar **30** which provides a vanishing point for the arm in all adjusted positions. It will be further noted that unlike the structure of my preceding copending application, such vanishing point is spaced outwardly from the outer end **87** of the guide arm and from the ends **32** of the support bars so that such structure only occupies a minimum of space outwardly from the board.

Accordingly, the marker guide arms **85** may be effectively utilized for conveniently and precisely constructing each side of the figure **95** drawn in two-point perspective upon the drafting paper **18** with the vanishing points maintained in precise location during swinging movement of the inner ends **86** of the arms **85** upon the board as their outer ends **87** are positioned along the arcuate path provided by the support bars **30**. Furthermore, the vanishing points may be adjusted between the top and bottom edges **11** and **12** of the board **10** in various positions by sliding movement of the mounting side arm **36** of the support bars along the guide rails **20** of the board. In addition, the vanishing points can be adjusted laterally inwardly and outwardly from the board by the use of various size support bars **30** of different arcuity, such as that shown at the righthand side of the board **10** in FIG. 1 which is utilized to construct the lines on the shorter side of the figure **95**.

A marker guide blade **100** is disposed adjacent to the top edge **11** of the drawing board **10** for constructing single-point perspective figures such as that identified by the reference numeral **101** on the drafting paper **18**. The blade is swingably mounted on the upper drawing surface **17** of the board and provides a pivot end **102** and an opposite end **103**. An elongated marker guide slot **105** is longitudinally extended between the ends of the blade for slidably receiving a suitable marking instrument, not shown, therethrough. The pivot end of the blade is mounted on the end of an elongated adjusting strap **108** by a pivot pin indicated by the reference numeral **109**. The strap includes a plurality of longitudinally equally spaced apertures **111** therethrough which are selectively alignable with a plurality of similar apertures **112** in an elongated mounting bar **114**. The strap and bar are constrained in their selected adjusted positions to locate the pivot end of the guide blade on the board by

a pair of spaced bolt and nut assemblies **115**. The mounting bar includes a head portion **116** which has a partially closed slot **117** therethrough for receiving the mounting flange **27** along the upper edge **11** of the board with one of the bolt and nut assemblies **115** adapted to be extended through the slot **28** in the flange to permit sliding movement of the mounting bar along the top edge of the board between the opposite side edges **14** thereof.

OPERATION

The operation of the described embodiment of the subject invention is believed to be clearly apparent and is briefly summarized at this point. With the arcuate support bars **30** disposed in tightly held relation upon the mounting rails **20** of the drafting board **10**, the marker guide arms **85** may be swingable upon the upper drawing surface **17** of the board about their respective vanishing points provided by the loci **34** upon manipulation of the mounting heads **60** along the arcuate track provided by their respective support bars. A suitable drafting instrument is extended through the guide slot **92** for constructing the lower edge, for example, of the figure **95** on the drafting paper **18** with the line resulting therefrom being precisely extended toward the vanishing point at its associated locus **34**.

During subsequent manipulation of the mounting head **60** along the arcuate path of its respective support bar **30** to swing the inner end **86** of the arm **85** upwardly toward the top edge **11** of the board, all the other lines on the right side of the figure, as viewed in FIG 1, can be drawn with the assurance that such lines are precisely extended toward the vanishing point and a true perspective figure is constructed. All the lines on the shorter lefthand side of the figure, as shown in FIG. 1, can be similarly constructed by use of the marker guide arm **85** mounted on the smaller arcuate support bar **30** at the right side edge **14** of the board. Any necessary horizontal lines of the figures can be constructed by the use of a T-square or the like.

When drawing the one-point perspective FIGURE 101, the guide blade **100** is utilized to construct the perspective lines of the viewable sides of the FIGURE 101 by proper manipulation of the blade to its desired angular positions on the board. Although not shown, longer or shorter guide blades may be substituted for the blade **100** during the drafting operation by removal of the pivot pin **109**. An additional mounting bar **114** is shown disposed in sliding relation on the upper flange **27** of the board for provding several vanishing points and marker guide perspective figures on the drafting paper **18**. It is noted that the pivot pin **107** of the guide blade provides a vanishing point which may be disposed either on or off the board and spaced from either the top edge or the side edges thereof. The guide arms **85** provide sufficient inherent flexibility in order to pass each other during the described adjustable swinging movement during the construction of a two-point perspective figure so that there is no appreciable interference between any of the described adjustable elements on the drafting board.

In view of the foregoing, it is readily apparent that the structure of the present invention provides an improved drafting device for constructing either one or two-point perspective figures on a single sheet of drafting paper. The arcuate path of travel provided by the support bars enables the guide arms to be continually radially aligned with their respective vanishing points provided by the locus of their associated arcuate support bars which permits the use of substantially shorter guide arms than is possible where the arms are physically pivotally mounted for swinging movement about their respective vanishing points as in my copending application. Accordingly, the drafting device of the present invention permits the construction of figures requiring remotely located vanishing points spaced substantial distances from the drafting board. The convenience and greater versatility of the drafting device of the present invention are believed readily apparent and amply demonstrated in a manner not possible with any known drafting device for the purpose.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

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

1. A perspective drafting device comprising a substantially flat board, marker guide means disposed in superimposed relation on the board and adapted to guide a suitable marking instrument on the board, support means providing an elongated substantially rigid arcuately formed guide bar having a correspondingly curved track concentric to a locus point spaced outwardly from the board and the guide bar, a clamping member releasably adjustably edgewardly mounting said guide bar on the board for positioning said locus point in a variety of selected positions relative to the board, and means slidably mounted in said track of the guide bar having releasable adjustable connection to said marker guide means mounting said marker guide means for movement through an arcuate path along said track of the guide bar in a variety of selectively adjusted positions in precisely aligned radial extension from said locus point of the track with said locus point constituting a vanishing point for the marker guide means in all said adjusted positions.

2. The perspective drafting device of claim **1** including rail means integrally edgewardly disposed along said board, and said clamping member being disposed centrally radially outwardly from the arcuate guide bar toward the board providing a slotted arm releasably slidably engaging said rail means for adjusting said support means in said selected positions relative to the board.

3. A perspective drafting device comprising a substantially rectangular flat board having predetermined upper and lower surfaces and top, bottom and opposite side edges with said side edges providing elongated guide rails coextensive therewith; an elongated substantially rigid arcuately formed guide bar having a locus about which the bar is constructed disposed in outwardly spaced relation from the bar and the board providing a slotted clamping member centrally radially extended therefrom toward the board slidably adjustably mounting the guide bar on said guide rail with the adjacent side edge of the board disposed is substantially tangential relation to the guide bar, said guide bar providing an arcuate guide track; an arm mounting head disposed upon said guide bar and having depending guide hooks slidably engaging said track on the guide bar; an elongated marker guide arm releasably longitudinally slidably mounted in said mounting head and having a longitudinal axis precisely aligned with said locus of the guide bar providing a vanishing point for the marker guide arm with said marker guide arm being movable with said mounting head along said arcuate guide track to provide a variety of selectively adjusted positions on the board and with said marker guide arm being continuously aligned with said vanishing point in all said adjusted positions.

4. The perspective drafting device of claim **3** in which a pair of said marker guide arms are provided having opposite outer and inner ends with their outer ends being releasably longitudinally slidably mounted in mounting heads by said arcuate guide tracks respectively adjacent to said side edges of the board with the inner ends of the marker guide arms disposed in overlapping superimposed relation on said upper surface of the board for the construction of two-point perspective drawings thereon.

5. The perspective drafting device of claim 4 including a marker guide blade disposed adjacent to said top edge of the board, a guide rail mounted in spaced substantially parallel relation along said top edge of the board, and an elongated support member slidably mounted on said guide rails pivotally mounting said blade for swinging movement about an axis of rotation providing a third vanishing point for constructing single dimension figures.

6. The perspective drafting device of claim 1 including a plurality of guide bars of varied arcuitry being interchangeably mounted upon said side edges of the board with said guide bars providing locus points spaced in a variety of positions from the board so as to adjust the vanishing points of the marker guide arms toward and from the board.

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HARRY N. HAROIAN, Primary Examiner