This invention relates to extendible drafting instruments which may be used by artists, draftsmen and the like for scribing arcuate figures and more particularly a compass having multiple elongated flat slidable blade-like members, which are inserted through and held by clamp device and pivot holder assembly. The clamp device and pivot holder assembly also function to guide and constrain longitudinal sliding motion of said blade-like members thereby accomplishing accurate adjustment to a desired length. The usual extending drafting compass is cumbersome to use requiring special scribe implements such as special lead holders and lead, and special inking pens.

Another difficulty experienced with prior art compasses results from the elevated position of the horizontal bar, sometimes called, “beam”, relative to the work surface, e.g., paper. High elevation from the work surface requires heavier beam construction to prevent flexure of the beam especially when drawing large radii arcuate figures. Furthermore, while in the elevated position the beam is easily tilttable, subject to unwanted movement, and requires special care in the handling thereof and subsequent scoring of the instrument.

In consideration of the foregoing difficulties, the present invention has for its particular object an improved extendible drafting instrument which is simple to use, inexpensive in its construction and effective in operation.

Another object of this invention is to provide an improved extendible drafting compass which is readily adjustable to scribe small and large radii arcuate figures.

Another object of this invention is to provide a compass with extension means to permit use in scribing larger circles.

Another object of this invention is to provide compass blade support means which lie flat on the work surface capable of being slide motion therethrough.

Another object of this invention is to provide a compass with a blade-like member having apertures contained therein thereby permitting the use of conventional drafting implements normally used for line scribing.

Another object of this invention is to provide a compass having clamping means to guide the blades, prevent lateral displacement and provide a locking mechanism for securing said blades at a desired position.

Another object of this invention is to provide a compass with a pivot holder assembly having clamp means and pivot holder means, said pivot holder means having a short point secured thereto which easily pierces a work surface.

Other objects and advantages of this invention will be readily apparent in the disclosure in the attached specification and from the accompanying drawing, wherein:

FIG. 1 is a plan view of a specific embodiment of the extendible drafting instrument comprising the subject matter of the instant invention showing, in phantom, a blade member in extended position;

FIG. 2 is a longitudinal cross-sectional view taken substantially along the plane indicated by the line 2—2 of FIG. 1, showing, in phantom, close positioning of the pivot point for smaller radii;

FIG. 3 is an enlarged transverse view shown in cross-section taken substantially along the plane indicated by the line 3—3 of FIG. 2 and illustrates an embodiment of the clamping means of the instant invention;

FIG. 4 is a perspective view of another embodiment of the instant invention and illustrates the addition of an extension blade member and additional clamp for obtaining even larger radii, and

FIG. 5 is a longitudinal end view of a modified blade member having a spacer element for elevating said blade member scribe means above the work surface.

Referring to the drawings, a preferred embodiment of the extendible drafting instrument or compass, is designated as numeral 8 and comprises a plurality of elongated flat members or blades 20, 30, 40, 50, 60 in combination with means for clamping, constraining and supporting said members such as an additional clamp device 18 and means for rotating said blades about a fixed point such as an adjustable pivot assembly 12.

Blade 10 has a substantially elongated portion terminating at an offset portion 15 at one end thereof. The elongated portion of said blade is of rectangular cross-section having flattened upper and lower surfaces 11, 13, parallel to each other. Offset portion 15 also has flattened upper and lower surfaces 37, 39, parallel to each other which are connected to their respective surfaces 11, 13 but vertically displaced therefrom and terminate at a semi-circular edge 39. Included in said offset portion 15 are aperture means 20, 22, 23 to be described later. As is shown in FIG. 2, lower surface 34 is in a coplanar relationship with surfaces 38, 30 when blade 10 is assembled for use. The offset portion 15 is formed to provide said coplanar relationship also providing a supporting surface when blade 10 is in an extended position. This added support provides stability which also reduces flexure of blade 10, 30 and permits utilization of thin blades.

Alternatively, as shown in FIG. 5, a blade member 19' may be provided with an offset portion 15' having a lower surface 34', which when in an assembled position, is not coplanar with surfaces 38, 30 but is elevated from said plane and parallel thereto. Spacer 70 is of rectangular cross-section having substantially flat parallel surfaces and is secured to surface 34', preferably in a transverse position, as shown in the drawing. Any suitable bonding technique such as gluing or ultrasonic welding may be used to secure said spacer.

In lieu of a spacer element separately attached to the offset portion of said blade, the same result may be achieved by molding the spacer into the blade member or alternatively by cutting away a portion of lower surface 34 thereby providing an elevated portion surrounding the aperture means 20, 22, 23.

Blade 32 is a flat member of preferably similar thickness to that of blade 10 for most of its length and includes a somewhat thicker portion 35 at one end thereof of which is not in slideable contact with blade 10.
Blade 42 is also a flat member of any suitable length having a somewhat greater thickness to that of blade 10 and similar to thicker portion 33 of blade 32. As shown in FIG. 4, blade 42 is an extension member which abuts blade 32 and firmly secured by clamp device 46.

Blades 10, 32, 42 may be formed from conventional materials of construction including metals, wood, plastic or combinations thereof. Preferable construction is of a suitable plastic, preferably with transparent properties to permit a direct viewing of the work surface below. Construction of blades 10, 32, 42 is by any conventional technique as by molding, die punching. As may be readily appreciated, blades 10, 32, 42 may be of any practical dimensions so long as there is adequate support provided to minimize flexure. Blades 10, 32, 42 need not be of identical dimensions. Extension blade 42 is attached to clamp device 46 for larger lengths. Radii lengths from less than 2" to 48" are therefore easily obtained. Even larger radii lengths may be obtained through use of similar extenders. Blades 10, 32, are arranged in a over-lay position to permit slidable adjustment relative to each other. FIG. 4 shows an extension blade 42 abutting blade 32, both of which are firmly secured by clamp device 46 to achieve these longer lengths.

FIG. 2 shows blade 10, 32 supported and guided by a clamp device 18 and pivot assembly 12 in a minimally offset position along the entire length or while in use. Clamp device 18 and pivot assembly 12 preferably have a rectangular cross-section with a generally rectangular bore 14 therethrough to accommodate said blade members 10, 32 which are inserted therethrough. All of the above-mentioned clamp means, which include clamp housing 50 at its approximately center position, a flat rectangular pressure plate 28 having means rotatably securing the lower non-threaded portion of the slack screw 26 within said pressure plate 28, said pressure plate being confined within the bore of clamp housing 50. Simple rotation of the slack screw 26 causes vertical downward or upward movement of pressure plate 28 thereby locking or unlocking blades 10, 32 positioned beneath plate 28.

Pivot assembly 12 comprises an adjustable clamp device 18 as described above, pivot holder 16 located in a preferably extended portion of the bottom surface 38 of clamp device 18 to permit easy viewing of the underlying work surface permitting the ready insertion at a preselected position the pivot point 24.

Pivot holder 16 preferably formed of transparent plastic material is suitably secured to pivot assembly 12 as being molded or threaded thereto or staked thereto. Pivot holder 16 secures pivot point 24 which may be formed of a short hard metallic material having a sharp point at its lower end and with the upper end suitably secured to pivot holder 16 as by being molded, threaded therein or staked thereto.

As shown in FIG. 2 the position of pivot assembly 12 is adjustable along the longitudinal axis of blades 10, 32. Rapid adjustment to a new radius length is made by loosening pressure plate 28 by rotating slack screw 26, sliding the blades 10, 32 which are guided by clamp device 18 towards pivot point 24, and retightening pressure plate 28 at the new position. Radii lengths of approximately 2" are obtained by removing clamp device 18 and slidingly pivot assembly 12 towards aperture 22; however, even shorter radius lengths are possible by reversing pivot assembly 12 to bring pivot point 24 closer to apertures 22, 23, etc. In scribing a circle, segment of circle, or other arcuate figure a conventional drafting pencil 44 may be used as well as other scribe implements in common use. Aperture means 20, 22, 23 for guiding said scribe implements are positioned along the longitudinal axis of blade 10 within the offset portion 15 of said blade. Said apertures are conventionally formed and extend from upper surface 37 through lower surface 34 or 35. Additional apertures may be provided in the vicinity of those described above.

Circular apertures 22, 23 may be of differing diameters for use with varying scribe thicknesses. Coriaceous entrace 36 is provided for easy insertion of said scribe implement. Notch aperture 20 provides means for utilizing inking devices, cutting tools, etc. A beveled edge 35 extending upwardly from surface 34 and terminating below upper surface 37 to provide an edge thickness capable of accommodating an adequate inking clearance thereby preventing smearing. Alternatively, when spacer element 70 is employed in conjunction with blade 10', beveled edge 35 may be eliminated and inking tools may be successfully employed in any of the apertures without fear of smearing the underlying papers due to the added space provided between the work surface and the lower surface 34'.

In using compass 8, the operator need only determine the exact length of the radius to be drawn, adjust the instrument by sliding the appropriate blade members to within the distance desired, tighten down the blade members by rotating thumb screw 26 which locks the blades in position. Pivot point 24 is placed on the work surface and depressed to puncture said surface thereby permitting free rotation of the instrument about the pivot point. The arcuate figures are thereafter drawn by inserting any suitable scribe implement in the appropriate aperture thereby making contact with the underlying surface.

As will be appreciated, the relatively limited area of bottom surfaces 30, 34, 38 relative to the length of the instrument permits easy movement and provides minimum contact with the underlying work surface. Since the lower surfaces of blades 32, 42 do not touch the work surface but are elevated therefrom, a cleaner work product results.

Furthermore, when blade 10' is substituted for that of blade 10, even less compass surface contacts the work surface even though the same degree of stability is achieved due to the supporting nature of spacer element 70.

While a specific embodiment of my invention has been disclosed in the foregoing description it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art.

What is claimed is:

1. An extendible drafting instrument for use in developing arcuate configurations on an underlying work surface comprising:
   a plurality of elongated blade members slideably positioned so the longitudinal axis of one member is in substantially vertical alignment with another member in superposed relation when the instrument is being used;
   aperture means disposed at one end of the instrument adapted to receive a scribe implement;
   releasable clamp means movable in the direction of said longitudinal axis for fixedly positioning the relationship of said blade members, including guide means for slideably adjusting said blade members; a pivot holder joined to the end of the other said blade.
member, said holder having a portion extending outwardly from the end of the blade member and being formed of substantially transparent material and including a pivot point secured thereto whereby the underlying work surface may be viewed from above and through said holder permitting the accurate placement of said pivot point into said surface for pivotal movement of said instrument.

2. An extendible drafting instrument in accordance with claim 1, said upper blade member having its forward end terminating at an offset portion downwardly directed with its bottom surface in slideable contact with the underlying work surface, said offset portion being formed with said aperture means extending vertically therethrough adapted to receive said scribe implement.

3. An extendible drafting instrument in accordance with claim 2, wherein said pivot point is centrally disposed and having a short sharp point fixedly secured to said pivot holder.

4. An extendible drafting instrument in accordance with claim 2, wherein the lower bottom surfaces of said clamp means, said offset portion and said pivot holder are in a substantially spaced coplanar relationship for slidably supporting said instrument.

5. An instrument in accordance with claim 1, wherein said lower blade member includes an enlarged end portion adapted for coplanar abutment with an extension blade member of substantially the same thickness of said enlarged end portion of said lower blade member, the abutting edges of each member being removably restrained within said clamp means.

References Cited

UNITED STATES PATENTS

144,264 11/1873 Diescher.
714,575 11/1902 Gove 33—158
1,636,637 7/1927 Hutchison 33—161
2,443,672 6/1948 Allen 33—27
3,250,010 5/1966 Smith 33—161

FOREIGN PATENTS

1,285,541 1/1962 France.
334,695 3/1921 Germany.

HARRY N. HAROIAN, Primary Examiner