Feb. 2, 1960 J. W. JONES, JR 2,923,066

VARIABLE DRAWING CURVE

Filed July 17, 1957

Fig. 1

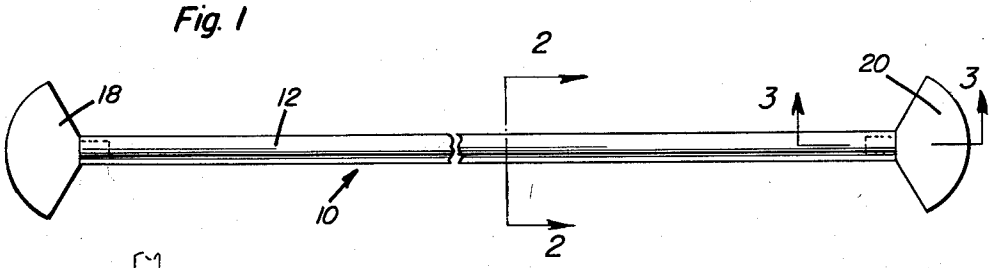


Fig. 2

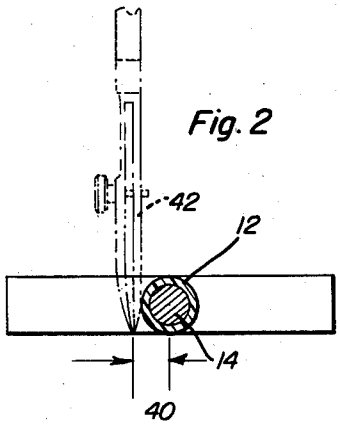


Fig. 3

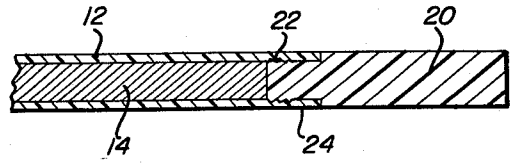


Fig. 4

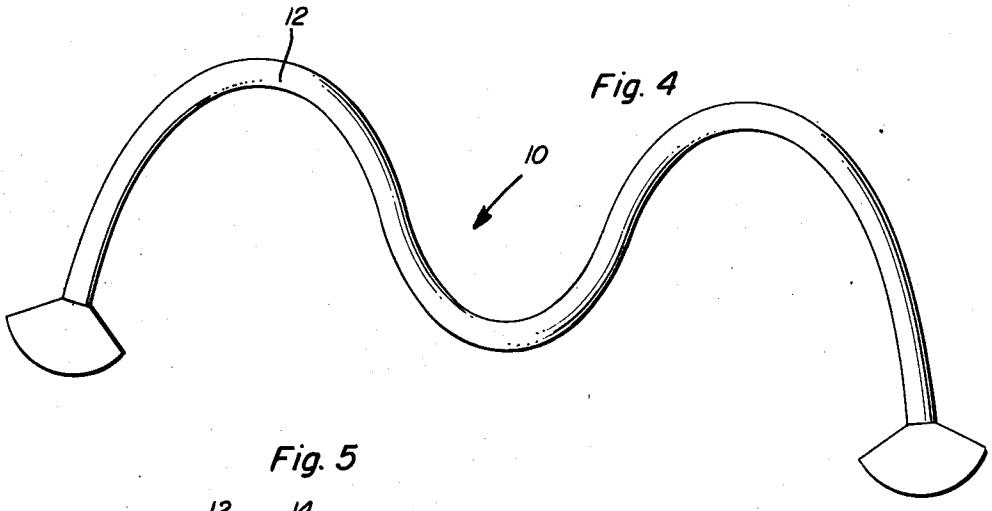
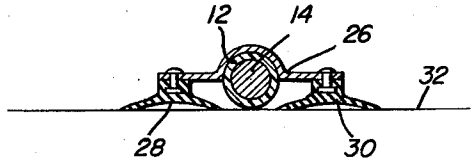


Fig. 5



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VARIABLE DRAWING CURVE

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Application July 17, 1957, Serial No. 672,475

2 Claims. (Cl. 33—177)

This invention relates to drawing instruments and more particularly to an adjustable rule for use in drawing irregular curves and the like.

The primary object of the present invention resides in the provision of an adjustable rule for curved configurations which can be used to locate and connect points in the development of a curved line or surface.

The concept of the present invention resides in the provision of means for assuming and maintaining a curved shape conforming to the contours of a curve which a draftsman desires to reproduce without requiring the assistance of numerous French curves or the like. Utilized in the present invention is a flexible tube filled with a thermoplastic substance which will rigidify at room temperature to hold the tube in an adjusted shape.

Still further objects and features of this invention reside in the provision of a variable drawing curve that is simple in construction, easy to utilize and relatively inexpensive thereby permitting wide use and distribution.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this variable drawing curve, a preferred embodiment being illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a plan view of the variable drawing curve comprising the present invention;

Figure 2 is a sectional detail view as taken along the plane of line 2—2 in Figure 1 illustrating the manner in which the circular sectional shape of the curve permits convenient inking processes;

Figure 3 is a fragmentary sectional detail view as taken along the plane of line 3—3 in Figure 1 and illustrating in an enlarged scale one of the removable and replaceable plugs utilized in the invention;

Figure 4 is a plan view of the invention showing how the device is used for reproducing a curve; and

Figure 5 is a sectional detail view illustrating the construction of means for detachably holding the rule to a source of heat or for detachably holding the rule to a drawing board.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral **10** generally designates the variable drawing curve comprising the present invention. This drawing curve or adjustable rule comprises a tube **12** of rubber or other suitable flexible material which is comparatively strong and adapted to be filled with a suitable thermoplastic material **14** such as wax, paraffin, a synthetic resin or the like. The thermoplastic material **14** may be easily melted at a temperature above a normal room temperature yet will solidify quite rapidly at room temperature. A source of heat commonly available to draftsmen and others is the wall of a fluorescent lamp and it is within the concept of the present invention for a draftsman to hold the tube against such a lamp for heating the thermoplastic material **14**. Of course, the instrument may be detachably secured to the lamp by any suitable means.

Either or both ends of the tube **12** may be closed by removable plugs of the type shown best in Figures 1 and 4 and shown in section in Figure 3. The enclosure plugs as indicated at **18** and **20** may be formed from any suitable material such as plastics or the like and are externally threaded as at **22** for threaded engagement with the internally threaded portion **24** of the tube. Alternatively, if threaded connections are not desired, friction connections may be utilized.

As shown in Figure 5, the tube **12** may be provided with means such as a clamping plate **26** provided with suction cups **28** and **30** for holding the tube **12** against a surface as at **32** which may be either the drawing board, or may be a source of heat such as a fluorescent lamp generally provided in drafting areas and rooms. In lieu of the clamping arrangement shown, suitable clips may be provided that are secured to the tube **12** preferably adjacent the ends thereof so as to leave the maximum intermediate portion free for use, which clips may be secured to the plugs **18** and **20**, or may be secured to one or both sides of the tube.

In use, the tube is filled with a suitable thermoplastic material such as paraffin, wax, suitable synthetic plastic resins, or the like and then subjected to a temperature sufficiently high to melt the thermoplastic substance in the tube **12**. This heat may be received from a fluorescent lamp or the like. The tube is then formed to the required shape and allowed to harden or solidify. A line may then be drawn with a pen or pencil held against one side of the device, the line resulting in a neat curve without the repeated use of portions of French curves.

It is preferred that the tube **12** be circular in section as shown in Figure 2, though other shapes may be equally adaptable. The use of the round shape **12** is advantageous for two reasons. The tube of circular shape will be least resistant to any type of folding or adjusting and in addition will provide a clearance as indicated at **40** which will reduce the possibility of blots due to ink creeping under the instrument when using an inking pen as indicated at **42**. Further, it is to be noted that the circular tube **12** is probably the easiest to construct.

It is noted that the thermoplastic material **14** may be of the type that will solidify at room temperature or at temperature slightly thereabove and that the tube may or may not have protuberances that will help in holding the device in place. Further, after the thermoplastic material **14** has hardened, reverse portions of an irregular curve may be accurately drawn by merely reversing the device to draw the reverse portion of the curve.

It is to be noted that the term "thermoplastic" used herein is to be construed as to cover the use of pure elements such as lead, etc., eutectic alloys, compounds, thermoplastic resins and organic compounds.

One eutectic alloy has been found to be very successful. This consists of 44.7% bismuth, 22.6% lead, 8.3% tin, 5.3% cadmium and 19.1% indium. This alloy has a melting point of 117° F. and in contrast to various waxes this alloy will pass from a liquid to a solid quickly, retains its solid shape well, yet permits a small amount of bending for adjustments.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An adjustable curve drawing instrument compris-

ing an elongated hollow member formed from flexible material capable to withstand heat without melting in an operating temperature range between a low point at room temperature and a relatively higher point, said member being adapted to be bent into a predetermined curvilinear form, a filler of thermoplastic material provided in said member, said filler being solid at said low point of the temperature range whereby to retain said member in a predetermined form but being plastic at said relatively higher point of the temperature range whereby to permit variation in the form of said member by bending, and closure plugs provided in the ends of said member, said plugs projecting beyond the ends of the member and having work engaging surfaces adapted for positioning of said member on a piece of work.

2. An adjustable curve drawing instrument comprising an elongated hollow member formed from flexible material capable to withstand heat without melting in an operating temperature range between a low point at room temperature and a relatively higher point, said member being adapted to be bent into a predetermined curvilinear form, a filler of thermoplastic material provided in said member, said filler being solid at said low point of the temperature range whereby to retain said member in a predetermined form but being plastic at said relatively higher point of the temperature range whereby to permit variation in the form of said member by bending, and closure plugs provided in the ends of said member and projecting beyond the same, said plugs having flat coplanar underside surfaces adapted for positioning on a piece of work and said member being bendable into a curvilinear form in a plane parallel to said surfaces.

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