

G. KÜHN.

APPARATUS FOR DRAWING CURVED LINES.

No. 552,293.

Patented Dec. 31, 1895.

Fig. 1.

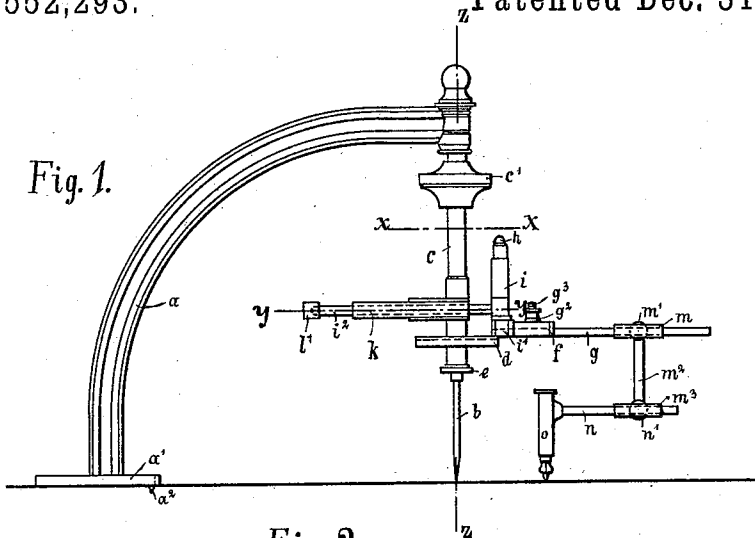


Fig. 2.

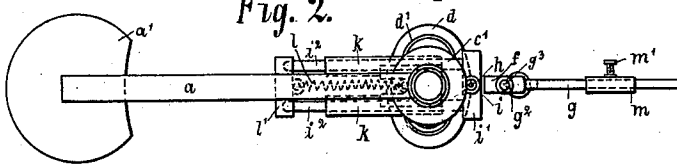


Fig. 4.

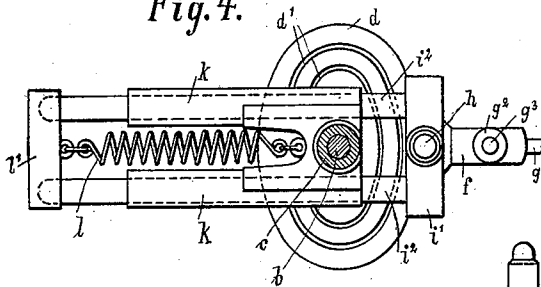


Fig. 5.

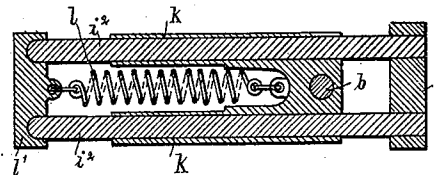


Fig. 10.

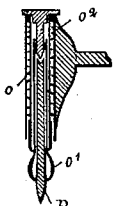


Fig. 7.

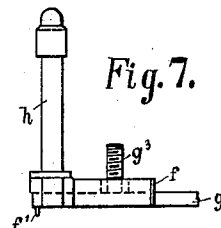


Fig. 8.

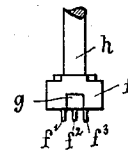
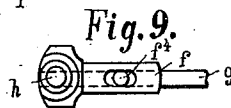


Fig. 9.



Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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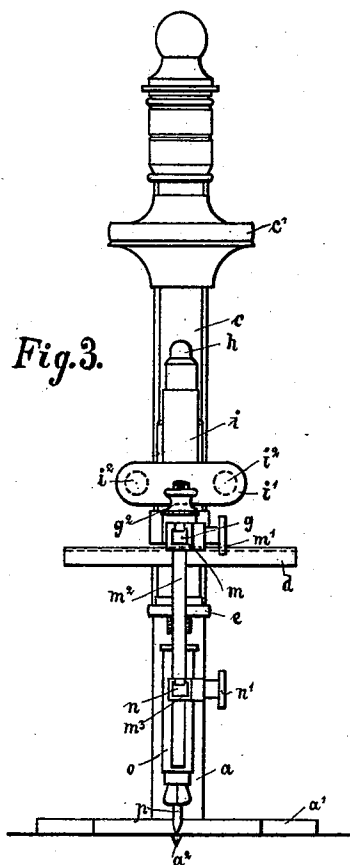


Fig. 3.

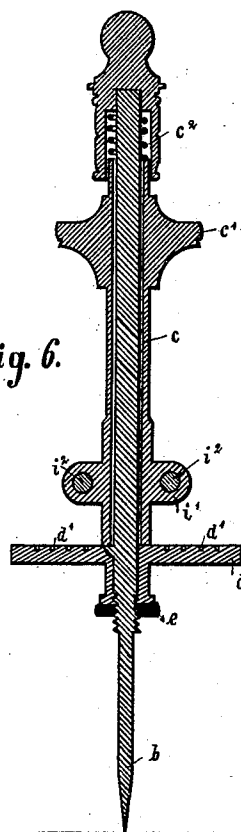


Fig. 6.

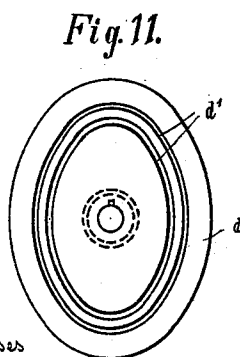


Fig. 11.

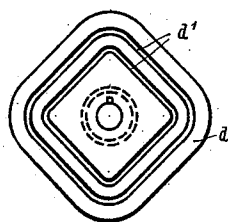


Fig. 13.

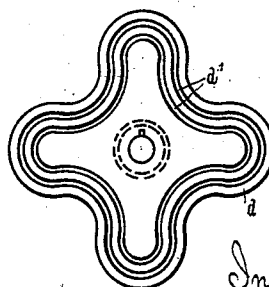


Fig. 12.

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UNITED STATES PATENT OFFICE.

GUSTAV KÜHN, OF GMÜND, GERMANY.

APPARATUS FOR DRAWING CURVED LINES.

SPECIFICATION forming part of Letters Patent No. 552,293, dated December 31, 1895.

Application filed July 16, 1895. Serial No. 556,154. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV KÜHN, manufacturer, residing at Gmünd, Kingdom of Württemberg, Germany, have invented certain new and useful Apparatus for Drawing Curved Lines, of which the following is a specification.

The want of an apparatus suitable for drawing or for increasing or diminishing the scale of drawings, consisting of various curved lines of frequent occurrence—such as ellipses, star-patterns and the like—without having to produce the said patterns by geometrical construction has often been felt as a great inconvenience in various trades. The apparatus described in the following specification is designed to obviate this inconvenience.

It consists of a drawing-compass which is capable of being employed in a simple manner for the sketching or drawing of any desired curved lines whether the same be required in pencil or in india-ink. For this purpose the pencil, drawing-pen or like instruments have their course determined by means of a curved disk which possesses guides whose form corresponds to the form of the curve to be produced.

The accompanying drawings show an apparatus of this description as follows:

Figure 1 is a side elevation. Fig. 2 is a plan. Fig. 3 is a front view. Figs. 4, 5, and 6 show sections on the lines $x x$, $y y$, and $z z$, respectively, of Fig. 1; and Figs. 7 to 13 show various details of the apparatus.

The frame a , provided with a foot-plate a' , supports a fixed vertical bar b , around which is placed a movable sleeve capable of rotating thereon and provided with a small hand-wheel c' and pressed upon and held down by a spring c^2 , Fig. 6. The lower part of the bar b is formed as a point which is placed upon the center of the curve, and in order to make the apparatus less liable to shift during the drawing the plate a' is also provided underneath with a point a^2 , Figs. 1 and 3. Underneath the sleeve c is placed the curved disk d , for which purpose the bar b bears a projection, to which, by means of a screw, the disk d is made fast.

Figs. 11 and 12 show the plan view of two curved disks d . Fig. 11 shows an ellipse, and Fig. 12 another symmetrical curved form.

In addition to these also unsymmetrical curves can be drawn as well as squares, rectangles and the like with rounded angles, Fig. 13. The curved disk possesses, as particularly shown in Fig. 6, grooves d' , whose forms correspond to those of the curves to be drawn and which guide the drawing-pencil or the like. For this purpose projections $f' f^2 f^3$, Fig. 8, engage in the said grooves, of which the pegs f' and f^3 are secured to a bar f , while the middle peg f^2 is secured to a bar g , adjustable in an opening of the bar f , Figs. 7, 8, and 9.

The bar f bears a projection h , which is placed upon a cross-piece i' , which connects the two bars $i^2 i^2$. The bars $i^2 i^2$ pass through sleeves $k k$, placed at right angles to the sleeve c , and may be made in one piece with the same.

The pattern apparatus bearing the sleeves $k k$ holds a spring l , Figs. 2, 4, and 5, which is connected with a cap l' provided with grooves. The bars $i^2 i^2$ engage in the grooves of the cap l' , whereby the pegs $f' f^2 f^3$, if they are in the corresponding groove of the curved disk, should always hold exactly against the end of the groove and effect an exact drawing.

In order that the pegs may be able to pass even sharp curves and nevertheless execute a precise drawing, the above-described middle peg f^2 is brought into use. For this purpose also the bar g , on which it is fixed, is made adjustable in the bar f and provided with a slot f^4 , Fig. 9, through which a peg g^3 , fixed by means of the screw g^2 , directs the rod g .

In order to insert a curved disk the process is as follows: After the old disk has been removed the new one is placed upon the projection of the bar b and fastened by means of the screw e . The bars $k k$ are then pushed forward, preferably after releasing the cap l' , and at the same time the sleeve c is pressed upward, so that the bars $f' f^2 f^3$ can engage in the corresponding grooves of the disk d . When this has been done the cap l' is again replaced upon the bars $i^2 i^2$. The drawing of the curve can now begin—that is, after the apparatus has been rightly adjusted and secured by means of the points. In order to draw, the apparatus should be held firmly with one hand and with the other hand the

wheel *c'* should be turned, whereby the whole mechanism carrying the pencil or other instrument will be set in motion. As the pegs *f'* *f*² *f*³ are engaged in the grooves of the curved disk the pencil must consequently follow the route corresponding to the form of these grooves, whereby the bars *i*³ *i*² will be pushed in or drawn out of the sleeves *k* *k* according as the spring *l* is pressed together or released. Each curved disk is preferably made with several grooves in order to be able to produce various forms with one and the same disk. For instance, the disk represented in Fig. 6 possesses four grooves, while the disk shown in Figs. 11 and 12 possesses two such grooves. An especial advantage of this apparatus consists in the fact that any curve can be drawn larger or smaller at pleasure. This is effected in a very simple manner by the adjustment of the piece *m* and the bar *n*. In this manner any one can easily draw any required number of symmetrical curves.

The sleeve or piece *m* is adjustable in the rod *g*, and carries the support *m*² with the sleeve *m*³ at its lower end, through which the bar *n* extends adjustably, being held in any position by a set-screw *n'*. The sleeve *m* is held adjustably by the set-screw *m'*.

The bar *n* carries the pencil-holder with the pen *o'* and is pressed by a spring *o*². (See Fig. 10.)

What I claim, and desire to secure by Letters Patent, is—

1. In combination, the standard *a*, the vertical bar *b*, having a pointed lower end, and having a screw threaded portion and a lateral projection, the disk *d* held thereon by engaging the projection and by a nut on the screw thread, the sleeve above the disk *d* having a hand wheel *c'* and a pencil carrier connected to the sleeve and having a projection engaging the groove of the disk, substantially as described.

2. In combination, the standard *a*, the fixed vertical bar *b*, means for securing the pattern disk adjustably thereto, the sleeve on the bar above the disk, and the pencil carrier connected with the sleeve and having a projection

engaging the groove of the disk, said pencil carrier having a lateral sliding connection with the sleeve with the spring for drawing the carrier toward the sleeve, substantially as described.

3. In combination, the bar *b*, the disk *d* thereon, the sleeve about the disk having the supporting piece with slide ways therein, the pencil carrier in connection with the disk and having extensions sliding in the ways of the supporting piece, and the spring for forcing the carrier laterally into place, substantially as described.

4. In combination, the bar *b*, the disk *d* thereon, the sleeve *c*, the block *f*, carried adjustably by the sleeve and having a projection engaging the groove of the disk, means for pressing the block into engagement with the disk, and the rod *g* also having a pin engaging the groove of the disk, said rod being arranged to slide in the block *f* and the pencil holder carried thereby, substantially as described.

5. In combination, the bar *b* having the pattern disk *d*, thereon, the rotary sleeve *c* and the laterally extending pencil support with means for pressing the same toward the disk, said support having a supplemental sliding portion, both the said support and the supplemental portion having a peg engaging the groove of the disk, substantially as described.

6. In combination, the bar *b*, having the disk thereon, the sleeve on the bar, the guides *k*, *k*, carried by the sleeve, the bars *i*² *i*², movable through the guides, the block *f* to which the bars are connected having the pegs *f'* *f*³, the spring for pressing the block toward the disk or the groove thereof, and the rod *g* having a sliding connection with the block *f*, and having a peg to engage the groove of the disk, and the pencil holder connected with the rod, *g*, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GUSTAV KÜHN.

Witnesses:

KARL FRIEDRICH BOSCH,
LUDWIG HOFFMANN.