

March 28, 1967

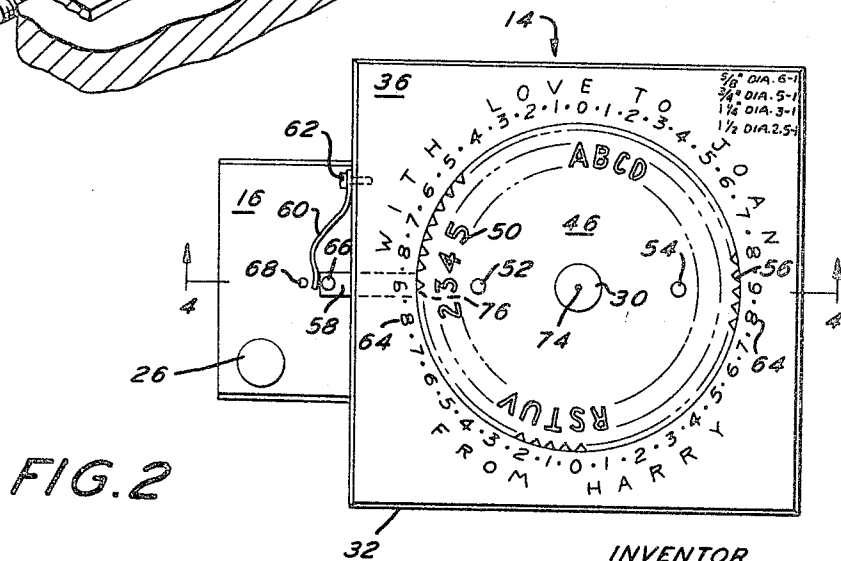
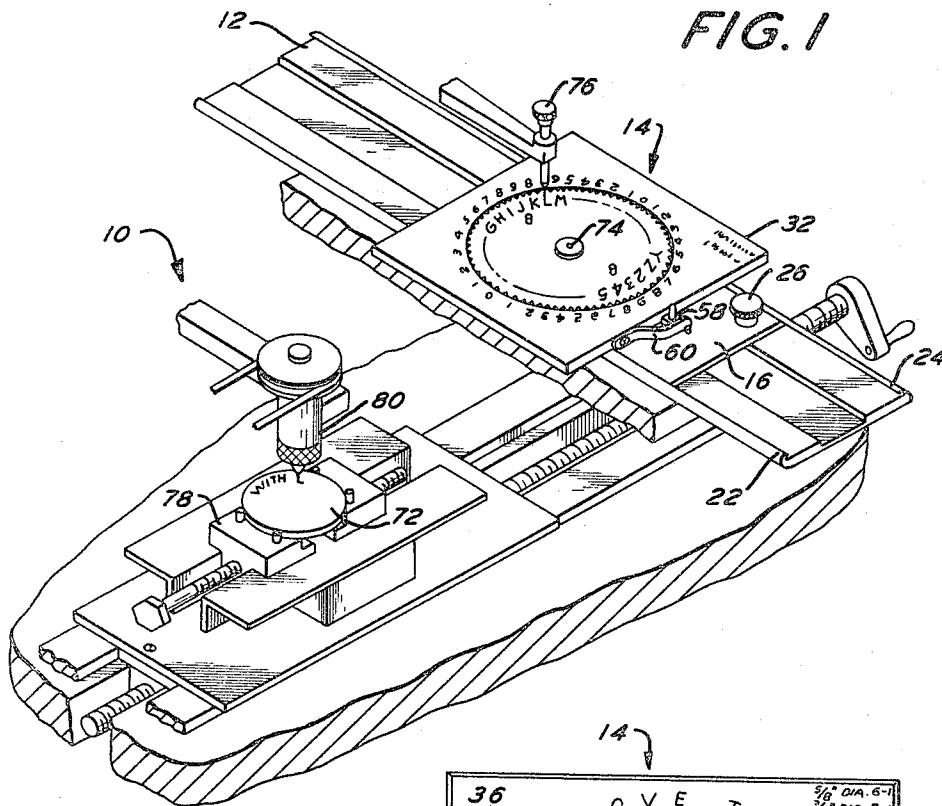
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3,310,874

CIRCULAR ENGRAVING APPARATUS

Filed Feb. 1, 1965

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

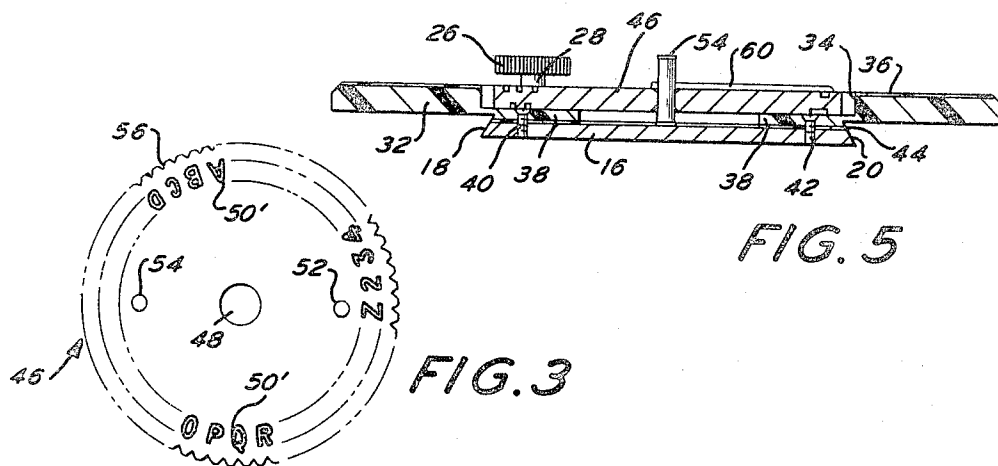
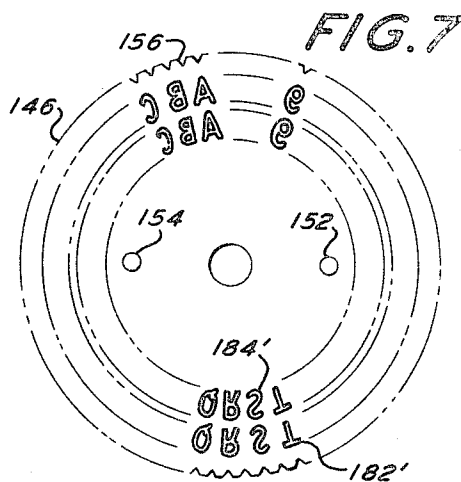
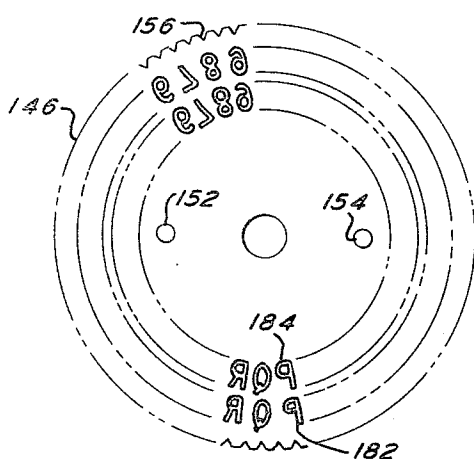
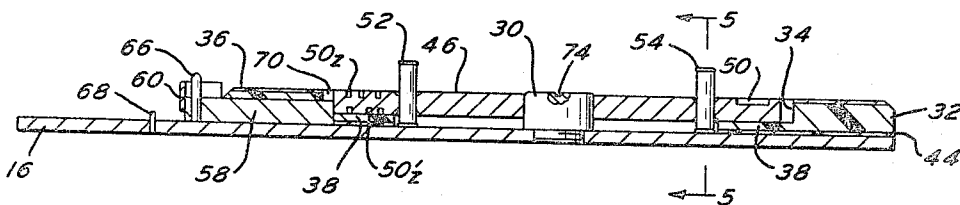


FIG. 4



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CIRCULAR ENGRAVING APPARATUS

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9 Claims. (Cl. 33—23)

In general, this invention relates to a new and improved engraving apparatus. More particularly, this invention relates to a new and improved apparatus for circular engraving.

Heretofore, custom engraving using engraving apparatus has been difficult because of the complicated manipulations which must be made in order to properly engrave around a circle of predetermined radius. These manipulations involve the movement of both the type and the article being engraved so as to provide proper radial and circumferential positioning of the characters. The present invention overcomes the disadvantages of prior devices by providing a circular engraving fixture which need be only initially laid out and centered on a pantograph. Thus, the present invention provides a fixture upon which a layout of the characters to be engraved may be made and then be mounted upon and used with an engraving apparatus without any adjustment beyond the initial one.

It therefore is a general object of the present invention to provide a new and improved circular engraving apparatus.

Another object of the present invention is to provide a new and improved circular engraving apparatus for use with a pantograph.

A further object of this invention is to provide a circular engraving apparatus having a layout surface and character disc.

Still another object of the present invention is to provide a rotatable character disc having circumferentially disposed characters thereon and means for laying out the arrangement of characters to be engraved.

Still another object of the present invention is to provide a rotatably mounted circular engraving disc and a layout surface having indicia thereon to properly lay out the characters.

Other objects will appear hereinafter.

For the purpose of illustrating the invention, there are shown in the drawings forms which are presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a partial perspective view of a pantograph having the circular engraving apparatus mounted thereon.

FIGURE 2 is a top plan view of one embodiment of the circular engraving apparatus in accordance with the present invention.

FIGURE 3 is a bottom plan view of the character disc mounted in the circular engraving apparatus shown in FIGURE 2.

FIGURE 4 is a longitudinal sectional view of the circular engraving apparatus taken along the line 4—4 in FIGURE 2.

FIGURE 5 is a transverse sectional view of the engraving apparatus taken along the line 5—5 in FIGURE 4.

FIGURE 6 is a top plan view of a second type of character disc which may be used with the circular engraving apparatus.

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FIGURE 7 is a bottom plan view of the circular character disc shown in FIGURE 6.

Referring now to the drawings, wherein like numerals indicate like elements, there is shown in FIGURE 1 a partial perspective view of an engraving tool designated generally at 10. The engraving tool shown is a pantograph. However, it is contemplated that other forms of engraving tools may be used.

The operation of the engraving tool is known to those skilled in the art and will not be explained except insofar as it is necessary to describe the present invention. The engraving tool 10 has an adjustable copy slide 12 upon which the circular engraving apparatus designated generally as 14 is mounted. As best shown in FIGURES 2 and 5 the circular engraving apparatus 14 includes a supporting base 16. As shown, the supporting base 16 is in the form of a flat plate having chamfered side edges 18 and 20. The chamfer angle of side edges 18 and 20 is the same as that of the angled inner surfaces of flanges 22 and 24 on copy slide 12. The width of supporting base 16 is equal to the width of copy slide 12 between the inner sides of flanges 22 and 24. Accordingly, the chamfered edges of the supporting base engage the angled inner sides of flanges 22 and 24 thereby non-rotatably supporting the base. A locking screw 26 is threadably mounted on the base 16 with its shank 28 adapted to extend through the bottom thereof. By tightening down the nut 26, the shank is caused to engage the copy slide 12. This locks the base into position after it has been properly adjusted along the longitudinal axis of copy slide 12.

A post 30 is mounted upon the base 16 intermediate the side edges 18 and 20. A layout table 32 having a circular recess 34 therein is also supported by the base 16. The circular recess 34 is concentric with the post 30. The layout table 32 may be made of a polymeric plastic such as Bakelite having a coating 36 made of another type of resin plastic such as polyvinyl chloride. The coating 36 is preferably white with a textured semi-gloss finish that may be readily written upon with pencil or the like.

A circular flange 38 protrudes from the side wall of recess 34. The flange 38 is opened at its center. Thus, the base 16 is exposed and the post 30 protrudes upwardly above the surface 36. The flange 38 is an integral part of the layout table 32.

The layout table 32 is supported on base 16 by four flathead screws, two of which 40 and 42 are shown in FIGURE 5. The screws 40 and 42 extend through countersunk holes in the flanges 38 and threadably engage the base 16. The countersunk holes in flange 38 permit the screws to be drawn down so that their heads are flush with or below the surface of flange 38. The length of screws 40 and 42 is such that their shanks do not protrude beyond the bottom of base 16. A gasket 44 is provided between the layout table 16 and flange 38.

A character disc 46 having a hole 48 whose diameter is equal to the outside diameter of post 30 is removably set within recess 34. The outside diameter of character disc 46 is equal to the inner diameter of recess 34. As best shown in FIGURES 4 and 5, the bottom surface of character disc 46 rests on the top surface of flange 38 when set within recess 34. A plurality of tracing characters 50 are cut into the character disc 46. As shown, the tracing characters may consist of the letters of the alphabet, the numerals from 2 to 9 (the numerals 1 and 0 may be represented by the letters I and O) and any addi-

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tional characters such as a period, comma, hyphen, or ampersand. The tracing characters are spaced about a circle whose center is concentric of the disc 46 and thus also concentric of the post 30 when said disc is set within recess 34. The centerline of each character is equi-

angularly spaced from the centerline of adjacent characters. Thus, if the disc is provided with 36 characters, then the centerline of each character will be spaced ten degrees from the centerline of the adjacent characters. The tracing characters 50 are formed by machines adapted to cut into the surface of character disc 46. FIGURE 4 illustrates that the characters are cut into the disc 46 by showing the letter Z in cross section, designated 50_z. The recessed nature of the characters 50 cut into the disc 46 permits them to receive a tracing stylus from the engraving tool which when caused to trace the characters 50 will operate the engraving tool to cut similar characters into the article being engraved.

Both sides of the character disc 46 are provided with tracing characters. The same characters are used on both sides of the disc and are equally spaced about a concentric circle of the same diameter. The distinction between the side of disc 46 shown in FIGURE 2 and its obverse side shown in FIGURE 3 is that the characters 50 in FIGURE 2 are arranged with their tops closest to the outer edge of disc 46 whereas the characters 50', shown in FIGURE 3, are arranged with their bottoms closest to the outer edge. The purpose in providing two sets of characters thusly arranged will be made apparent in the following pages.

A pair of diametrically opposite lugs 52 and 54 extend through holes in the character disc 46. The length of the lugs 52 and 54 is such that they protrude a substantial distance above character disc 46 when the same is set within recess 34. The ends of lugs 52 and 54 are peened to retain the same within the holes on character disc 46. The lugs 52 and 54 provide a means whereby the character disc 46 may be lifted from the recess 34 to reverse the same or to replace it with another disc having different characters. The lugs 52 and 54 may also be used to rotate the disc within recess 34. The character disc 46 and lugs 52 and 54 are preferably made from a metal such as a hard brass alloy.

The outer periphery of character disc 46 is provided with index notches 56. The number of notches on the periphery of character disc 46 is equal to twice the number of characters on the disc. Moreover, every second notch is aligned with the centerline of a character. Accordingly, if a character disc is provided with thirty-six characters, then it will have seventy-two notches spaced apart five degrees.

The notches 56 are normally engaged by a dog 58 that extends through a slot in the bottom surface of layout table 32. The dog 58 is biased inwardly into engagement with the notches 56 by a flat spring 60 that is fixed at one end to the layout table 32 by a screw 62. The spring 60 normally biases the dog 58 into engagement with a notch 56 in character disc 46 thereby fixing its position so that the characters 50 are aligned with layout indicia 64 on surface 36.

A peg 66 extends upwardly from the dog 58 to provide a handle whereby the dog 58 may be reciprocated out of engagement with a notch 56 to permit the character disc 46 to be rotated. A pin 68 provides a backstop for the dog 58. A cut-out recess 70 in the flange 38 permits the dog 58 to move forwardly into engagement with the notches 56 in character disc 46 and also acts as a front stop when the character disc 46 is removed from recess 34.

As indicated above, a plurality of layout indicia 64 are provided on the surface 36. The layout indicia may be formed by cutting through the white surface 36 to expose the darker portion of layout table 32. As illustrated, the layout indicia preferably comprise the numerals from 0 to 9 to 0 to 9 to 0 equally spaced around

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the periphery of recess 34. This provides thirty-six layout numerals which is the same number of numerals as characters on character disc 46. The layout indicia 64 additionally include a dot between each of the numerals. Accordingly, there are seventy-two layout indicia which may be aligned with the characters 50 on character disc 46.

As shown in FIGURE 2, the dog 58 is positioned directly below the layout indicia "9." When dog 58 engages one of the notches 56 aligned with a character all of the characters 50 will be aligned with the layout numerals. This situation is illustrated in FIGURE 2. On the other hand, if the dog 58 engages a notch 56 that is intermediate the characters 50 then the characters 50 will be aligned with the layout dots intermediate the layout numerals. Thus, it may be seen that the dogs 58 and notches 56 cooperate to fix the characters 50 on character disc 46 in alignment with either the layout indicia numerals or the layout indicia dots. The purpose in this will become readily apparent from the description of the operation of the device which follows.

The circular engraving apparatus is operated as follows:

The first step is to slide the base 16 onto the copy slide 12. Next, the diameter of the disc 72 to be engraved is measured. If the outside diameter of the disc is approximately the dimensions set forth in the upper righthand corner of the layout table 32 then the pantograph 10 is set to the indicated ratio. The means for setting the pantograph ratio is known and need not be described in detail. If the size of the disc is other than the dimensions indicated on the layout table 32, a ratio closest to the size indicated is used. For example, if disc 72 measures seven-eighths of an inch, the ratio should be set at 4:1.

The next step in operation of the apparatus is to center the disc 72. After the correct ratio has been set the engraving apparatus is moved to a point where the centering hole 74 in post 30 is below the tracing stylus 76. The centering disc (not shown) is placed into the workholder 78. The cutting stylus 80 or graver is placed into the central hole in the centering disc. The workholder 78 is then adjusted until the tracing stylus 76 will fall into the centering hole 74. At this point the workholder and base 16 are securely fixed in place.

After the center has been determined the centering disc is replaced with the object 72 to be engraved.

The next step is to lay out the indicia to be engraved. For purposes of illustration, the layout for "WITH LOVE TO JOAN" and "FROM HARRY" will be described.

The first step in laying out the characters to be engraved is to count the number of characters including spaces in the counts. Thus, the engraving "WITH LOVE TO JOAN" would include seventeen characters as follows:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
W I T H L O V E T O J O A N

The next step is to note that there are an uneven or odd number of characters. This being the case, the center of a character will be the center of the layout. In this case, the letter E is the ninth or center character. Therefore, the letter E should be marked above the zero on the surface 36 of layout table 32. The zero indicia indicates the center of all layouts. With the center of the layout established, the remaining characters are marked in directly above the numerals of the layout indicia 64. The complete layout of "WITH LOVE TO JOAN" is shown in FIGURE 2. The layout should be marked on the surface 36 in pencil or some other easily removable marking substance so that repeated use can be made of the layout table.

The next step is to engrave the disc 72. This is accomplished as follows:

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The dog 58 is moved rearwardly against pin 68 to free the character disc 46 for rotation. The character disc 46 is then rotated so that the tracing letter "W" is located directly below the previously marked "W." The dog 58 is released so that character disc 46 is fixed in position. The next step is to engrave using the stylus 56 and cutting stylus 80 in the known manner. Then the operation described with respect to the letter "W" is repeated for the tracing character "I." That is, the character "I" is moved under the previously laid out "I" and the engraving operation is performed. This procedure is repeated until "WITH LOVE TO JOAN" is completed.

The next step is to engrave "FROM HARRY" on the lower part of the disc 72. Generally, it is desirable to obtain "FROM HARRY" in an upright position. Accordingly, the character disc 46 is reversed so that the side shown in FIGURE 3 will be facing upwardly within the recess 34. This permits the lower part of the disc 72 to be engraved in upright characters. The character disc 46 is reversed by removing it from recess 34 by means of lugs 52 and 54.

The next step is to lay out the characters for "FROM HARRY."

1 2 3 4 5 6 7 8 9 10
FROM HARRY

As shown above, the layout for "FROM HARRY" has ten characters including the space. Thus, there is an even number of characters which means the center of the layout falls half-way between the space and the "H." As indicated before, the numeral zero of indicia 64 indicates the center point. Therefore, the dots of layout indicia 64 are used because this will place the zero half-way between the space and the letter "H" as shown in FIGURE 2. The final step is to engrave the characters "FROM HARRY." This is accomplished in the manner described above.

The embodiment described and shown in FIGURES 1-5 is for engraving discs of various size such as charms, watch dials, and the like. If different size discs 72 are to be engraved, it is only necessary to change the ratio and re-center the disc in the manner described above.

The embodiment described with respect to FIGURES 1-5 is adapted to engrave a single row of letters of predetermined radius. In another embodiment of the present invention, the character disc may be adapted for engraving several rows.

Referring now to FIGURES 6 and 7, there is shown a character disc 146 having a pair of lugs 152 and 154, notches 156, and two rows of tracing characters 182 and 184 thereon. As shown, the tracing characters in rows 182 and 184 are reversed about their median axis to form a mirror image character. The tracing character thus cut into the character disc 146 may be used to engrave reversed or mirror image characters for use in notary seals. By providing two rows of characters, the object may be engraved with two rows. If desired, additional rows may be added.

The provision of two rows has another distinct advantage. Notary seals are for the most part manufactured in three diameters. By providing a circular engraving apparatus with two character discs, one of which has two rows of characters at the required diameters and the other of which has one row of characters at the third diameter, it is possible to provide an apparatus for engraving substantially all notary seals.

The operation and use of the character disc 146 in FIGURES 6 and 7 is the same as that described with respect to the character disc 46 in FIGURES 2 and 3. As shown in FIGURES 6 and 7, the characters in rows 182 and 184 will engrave lower upright characters and the characters 182' and 184' will engrave upper upright characters.

The present invention may be embodied in other specific forms without departing from the spirit or essential

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attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specifications as indicating the scope of the invention.

I claim:

1. Apparatus for circular engraving comprising a support base for mounting said apparatus on an engraving machine, a character disc rotatably supported by said support base, a plurality of tracing characters on said disc, said tracing characters being circumferentially positioned on said disc, said tracing characters being adapted to receive an engraving tool tracing stylus, a layout surface juxtaposed said disc, said layout surface having a plurality of circumferentially disposed layout indicia fixed thereon, said layout surface being adapted to have written thereon a representation of the characters to be engraved, said plurality of layout indicia circumferentially arranged on said layout surface being concentric of said circumferential tracing characters and at equally spaced angular distances, a plurality of index notches on said disc, a dog cooperating with said notches and positioned for rotatably locking said disc with said characters in radial alignment with said layout indicia.

2. Apparatus in accordance with claim 1 wherein said support base includes a post about which said disc is rotatable, and a centering recess in said post.

3. Apparatus in accordance with claim 1 wherein said layout surface has a circular recess therein, and said disc is adapted to be received therein.

4. Apparatus in accordance with claim 3 wherein said dog extends partially into said recess, and resilient means for biasing said dog into cooperation with said notches.

5. Apparatus in accordance with claim 1 wherein said disc has at least one eccentric hole therethrough, and a lug reciprocally received in said hole, and means on said lug for retaining it in said hole.

6. Apparatus in accordance with claim 1 wherein said disc has tracing characters on both sides, the tracing characters on one side being upside down with respect to the tracing characters on the opposite side.

7. Apparatus in accordance with claim 6 wherein two circumferential rows of tracing characters are provided on each side of the character disc.

8. Apparatus in accordance with claim 1 wherein said characters are spaced apart by equal angular distances, and the number of said layout indicia is equal to twice the number of tracing characters, said layout indicia being equally spaced apart by one-half the angular distances between said characters, whereby said indicia may be used for laying out phrases having an odd and even number of characters to be engraved.

9. Apparatus for circular engraving comprising a support base for maintaining said apparatus on an engraving machine, a post on said support base, a character disc mounted on said support base, said disc being rotatable about said post, a plurality of tracing characters circumferentially arranged on said disc at equal angular distances, said tracing characters being recessed for receiving an engraving tool tracing stylus, a layout table having a circular recess, said layout table being mounted on said base, said character disc being received within said layout table recess, a layout surface on said layout table, said layout surface being adapted to have written thereon representations of the characters to be engraved, a plurality of circumferentially arranged layout indicia on said layout surface concentric with said tracing characters, the number of said indicia being twice the number of said tracing characters and being spaced apart by one-half said equiangular distances, notches on the periphery of said disc, the number of said notches being equal to the number of said indicia, dog means reciprocally projecting into said circular recess adjacent to the periphery thereof for engaging said notches, said dog means locking said disc with said characters in radial alignment with one-half the number of indicia.

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