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C. D. TUSKA ET AL

PANTOGRAPH ENGRAVING TOOL

Filed June 13, 1923

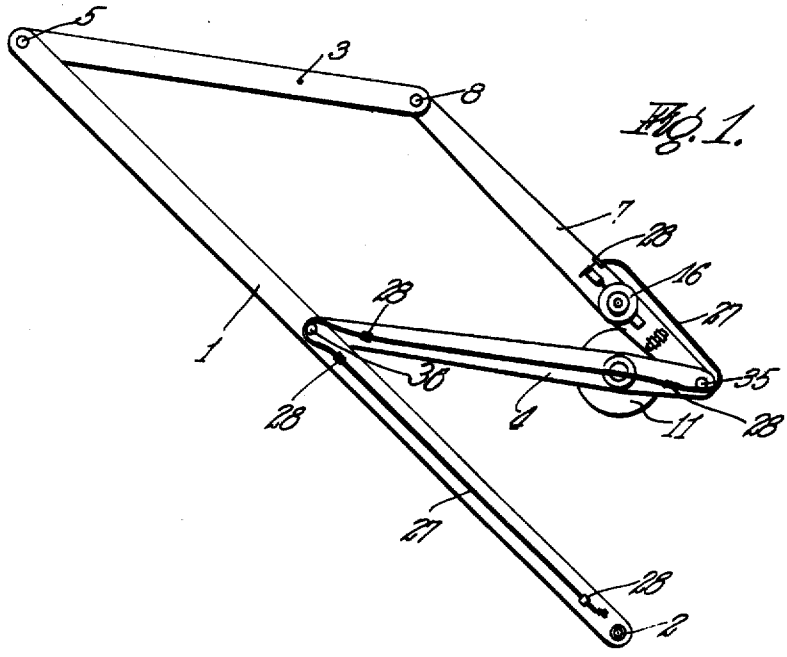


Fig. 1.

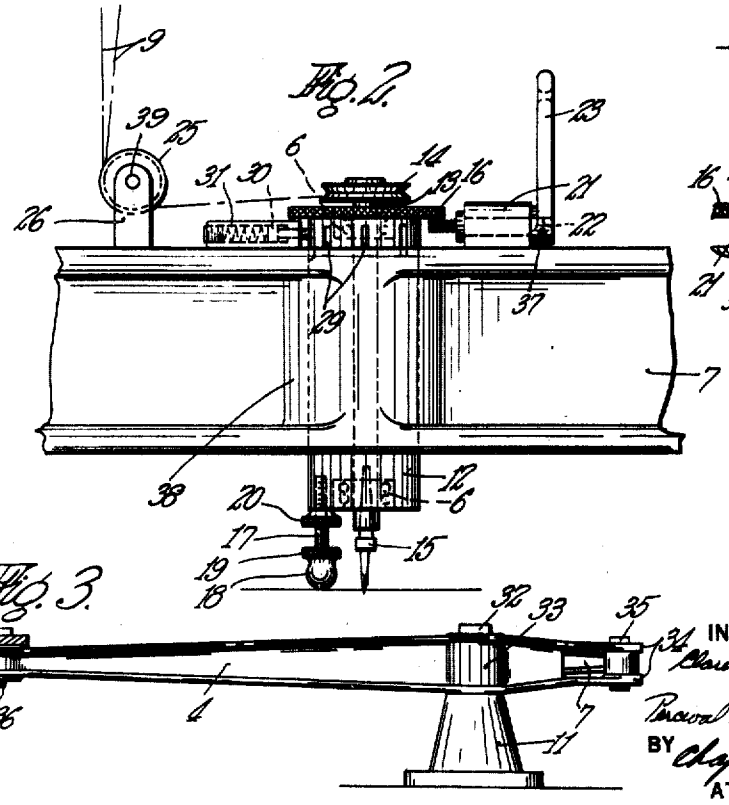


Fig. 3.

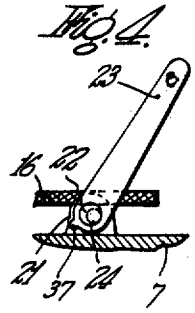


Fig. 4.

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UNITED STATES PATENT OFFICE.

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PANTOGRAPH ENGRAVING TOOL.

Application filed June 13, 1923. Serial No. 645,100.

To all whom it may concern:

Be it known that CLARENCE D. TUSKA and PERCIVAL H. SPENCER, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Pantograph Engraving Tools, of which the following is a specification.

This invention relates to an engraving device and more particularly to a device wherein the principle of a pantograph is employed for the purpose of reproducing from a suitable pattern, letters, figures, etc., similar characters of smaller size on the object to be engraved.

One object of the invention is to provide a simple and efficient arrangement whereby the engraving of accurate characters on very hard substances, such as panels for radio cabinets, is accomplished within a minimum space of time and from patterns of large size thereby reducing the perceptible error.

Another object is to construct a device employing a comparatively large size pattern involving a considerable distance between the engraving tool and tracing point wherein the working or engraving tool may be controlled from a point in proximity to the tracing point.

Another object is to provide a device of this character wherein the depth of cut of the working or engraving tool is regulated by a support adjacent to the working tool contacting with the surface on which the engraving is to be done whereby the depth of cut on uneven or inclined surfaces is uniform.

With these and other objects in view the invention consists in the various features of construction and in the combination and arrangement of parts, hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art.

In the accompanying drawings;

Fig. 1 is a plan view of the device;

Fig. 2 is an enlarged side view of a portion of the tool arm and mountings thereon;

Fig. 3 is a detail side view showing the base and supporting arm thereon; and

Fig. 4 is a detail view of the lever arm and mounting looking to the left in Fig. 2.

Referring to the drawings, 11 represents the base preferably of heavy construction and secured to a supporting medium such as a table. The base 11 is provided with a vertical shaft 32 on which the main supporting arm 4 of the device is mounted by means of a bearing 33. The arm 4 is preferably mounted on the shaft 32 by means of a ball bearing (not shown) and the point on the arm 4 where bearing 33 is located will provide for the desired reduction of the pattern taken in connection with the various other parts of the device to be hereinafter described. This arm 4 may be made of light but strong material but is so designed as to be in the nature of a truss bar as shown. At one end of the arm 4 there is provided a yoke or forked construction 34 in which one end of the tool guiding arm 7 is swivelly connected by means of a stub shaft 35 passing therethrough. This swivel connection is preferably of a ball bearing type but may be of the usual pin and socket construction as shown in the drawing. This arm 7 may also be made of light but strong material such as aluminum. At the other end of arm 4 there is pivotally connected thereto the tracing arm 1 at a suitable point intermediate the ends of the latter by means of stub shaft 36. This may also be a ball bearing type connection. At one end of the tracing arm 1 is the tracing point 2 and the other end is connected to the other end of the tool guiding arm 7 by a tie arm 3 having pivotal connections 5 and 8 therewith. It will be observed that the arms 1, 3, 4 and 7 are connected in the usual parallelogram form for pantograph action, the ratio of reduction between the tracing point and the working point being preferably about 7 to 1.

At a suitable point on the tool guiding arm 7 there is provided a boss 38 in which is located a heavy bearing 12. Through this bearing 12 extends a shaft 13 positioned therein by means of ball bearings 6—6 and having a pulley 14 fixed at its upper end and provided with a socket in its lower end to fixedly receive an engraving tool 15. The upper end of the bearing 12 is provided with a fixed knurled ring nut or washer 16 for a purpose to be presently described. At the lower end of bearing 12 adjacent the outer edge thereof and screw-threaded therein is a bearing support or stop 17 provided at its lower end with a

work follower 18 for contact with the work to be engraved and having a knurled portion 19 for adjusting the same. A suitable knurled lock nut 20 is provided for securing the stop 17 in a desired position after being adjusted by means of manipulating the knurled portion 19.

On the upper edge of the arm 7 on one side of bearing 12 is a small recessed boss 21 through which a shaft 22 extends having a lever arm 23 at its outer end. The inner end of the shaft 22 is provided with an eccentric stud 24 extending beneath the ring nut or washer 16 to raise or lower said bearing 12 when said arm 23 is operated. To the upper end of lever arm 23 there is connected a Bowden wire 27 or other similar means which runs through clamps 28 on arms 7, 4, and 1 to a point adjacent the tracing point 2. By means of a pushing or pulling movement on this Bowden wire 27 the lever arm 13 is rocked through an angle of 90° which in turn by means of the eccentric stud 24 will elevate or lower the bearing 12 and engraving tool 15.

The lever arm 23 and eccentric stud 24 are so positioned relative to each other that when the lever arm 23 is in the position as shown in Fig. 4 the bearing 12 is not held in an elevated position but is supported upon the work by the stop 17. When the lever arm 23 is rocked to the left through an angle of 90° by means of the Bowden wire 27, the eccentric stud 24 engages the under side of the washer 16 and raises the bearing. The 90° movement of the lever arm 23 brings the eccentric stud 24 a little beyond the line of centers, thereby providing a releasable holding means for the lever. There is also provided a stop 37 on the lower end of lever arm 23 to limit the swinging action of the lever in this direction. On the opposite side of the bearing 12 on arm 7 there is located a shaft 39 having a pair of idler pulleys 25 thereon. The shaft is supported on a pair of lugs 26 fixed to arm 7. 9 represents an endless belt which connects a motor (not shown) for supplying power to rotate the engraving tool 15.

There is thus provided a control over the engraving tool which is adjacent the tracing point. This is especially desirous where the proportions of the arms 4 and 7 and arms 1 and 3 are large as it enables the operator of the tracing point to work continuously without moving around to elevate the engraving tool every time he moves the tracing point out of the master characters. The bearing 12, by being slidably mounted in the arm 7, has a floating up and down movement and the tool 15, being fixed in the rotating shaft 13, which in turn is positioned in the bearing 12, also has this floating up and down movement. The stop 17, by riding in contact with the work to be engraved, acts as a work follower and controls the vertical floating movement of the bearing and tool. It will be observed that by means of this arrangement the stop 17 will limit the depth of cut of the revolving tool 15 and maintain the same depth of cut over any part of the work surface whether that surface is level or not. This stop 17 is also provided with means to adjust same with respect to the engraving tool 15 so that the depth of cut may be regulated to any desired depth.

I have also provided means to index the stop 17 so that where the engraving is near or at the outside edges of the engraved object the work follower 18 will remain in contact with the surface of the engraved object. This means comprises preferably a plurality of indentations 29 on the upper cylindrical surface of the bearing 12 coacting with a spring pressed plunger 30 located in a socket 31 on top of arm 7 closely adjacent to the bearing. The indentations 29 are of such a shape that the end of the plunger 30 will yieldingly retain the bearing in fixed position but will allow the bearing to manually be turned to position the work follower 18 in any desired location around the axis of the engraving tool.

While I have disclosed a preferred embodiment of my device it is understood that the scope of the invention is defined by the appended claims:

1. A pantograph engraving device comprising in combination, a tool guiding arm, a weighted non-rotating bearing slidably mounted in said arm for a floating up and down movement, an engraving tool revolvably mounted in said bearing and carried vertically therewith, a tracing arm having a tracing point remote from said engraving tool and means acting on said vertically movable bearing for elevating and lowering the same with said engraving tool said means being operable from the proximity of said tracing point.

2. A pantograph engraving device comprising in combination, a tool guiding and supporting arm, a weighted bearing slidably mounted in said arm for up and down movement, an engraving tool revolvably mounted in said bearing and movable vertically therewith, a tracing arm having a tracing point remote from said engraving tool, a stop on said bearing for limiting the depth of cut of said engraving tool and means for elevating and lowering said engraving tool operable from the proximity of said tracing point.

3. A pantograph engraving device comprising in combination, a tool guiding arm, a weighted bearing slidably mounted in said arm for a floating up and down movement, an engraving tool revolvably mounted in said bearing and movable vertically therewith, a tracing arm having a tracing point,

an adjustable stop on said bearing and adapted to ride upon the work to be engraved for regulating the depth of cut of said engraving tool.

4. A pantograph engraving device comprising in combination a tool guiding and supporting arm, a weighted bearing slidably mounted in said arm for up and down movement, an engraving tool revolvably mounted in said bearing and movable vertically therewith, a tracing arm having a tracing point remote from said engraving tool, a stop on said bearing for limiting the depth of cut of said engraving tool, means for indexing said stop about the vertical axis of said bearing and means for elevating and lowering said engraving tool operable from the proximity of said tracing point.

5. A pantograph engraving device comprising, in combination, a tracing arm having a tracing point, a tool guiding arm, a rotating tool carried in said guiding arm arranged for a floating vertical movement and a work follower separate from said tool and arranged to ride in contact with the work to be engraved for controlling the vertical floating movement of said tool.

6. A pantograph engraving device comprising, in combination, a tracing arm having a tracing point, a tool guiding arm, a rotating tool carried in said guiding arm remote from said tracing point and arranged for a floating vertical movement, a work follower separate from said tool and arranged to ride in contact with the work to be engraved for controlling the vertical movement of said tool and means for elevating said tool from said work operable from the proximity of said tracing point.

7. A pantograph engraving device comprising, in combination, a tracing arm having a tracing point, a tool guiding arm, a rotating tool carried in said guiding arm arranged for a floating vertical movement, a work follower separate from said tool and arranged to ride in contact with the work to be engraved for controlling the vertical floating movement of said tool, and means for adjusting said work follower with respect to said tool to regulate the depth of cut of said tool.

8. A pantograph engraving device comprising, in combination, a tracing arm having a tracing point, a tool guiding arm, a rotating tool carried in said guiding arm arranged for a floating vertical movement and a work follower separate from and closely adjacent to said tool and arranged to ride in contact with the work to be engraved for controlling the vertical floating movement of said tool.

In testimony whereof we have affixed our signatures.

CLARENCE D. TUSKA.
PERCIVAL H. SPENCER.

DISCLAIMER.

1,516,897.—*Clarence D. Tuska* and *Percival H. Spencer*, Hartford, Conn. PANTOGRAPH ENGRAVING TOOLS. Patent dated November 25, 1924. Disclaimer filed May 28, 1925, by the assignee, *The C. D. Tuska Company*.

Hereby enters this disclaimer to any interpretation of claims 5, 7, and 8 of said Letters Patent in which the phrase, in each of said claims, "a rotating tool carried in said guiding arm arranged for a floating vertical movement" does not mean that said rotating tool is capable of a floating vertical movement in said guiding arm and relative thereto.

[*Official Gazette June 23, 1925.*]