Sept. 10, 1957 H. K. ADAMS 2,805,475

FINE LINE ENGRAVING TOOL FOR MAP MAKING

Filed July 22, 1955

FIG. 1

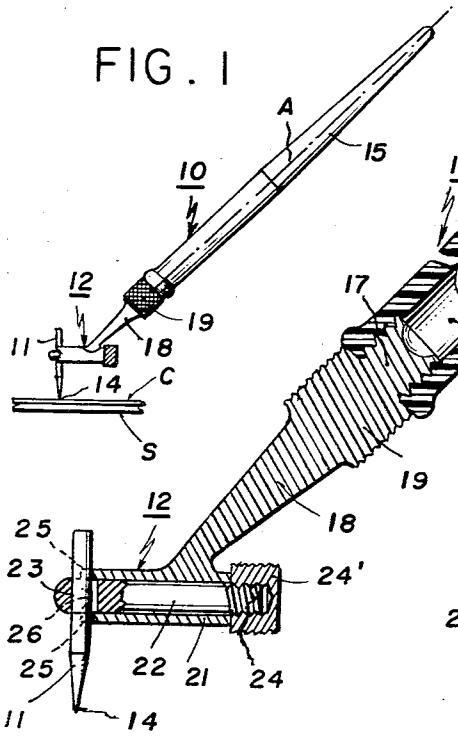


FIG. 2

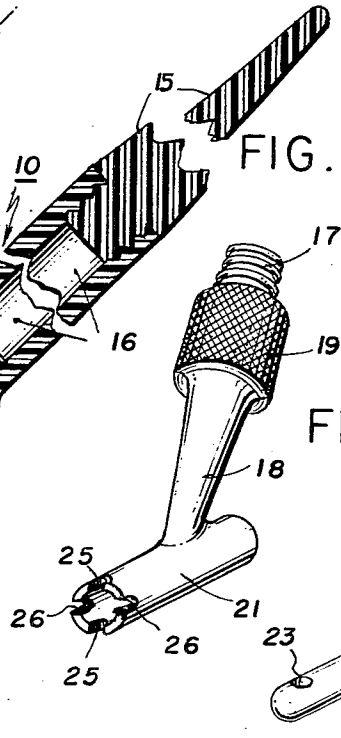


FIG. 3

FIG. 4

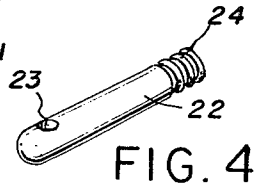


FIG. 5

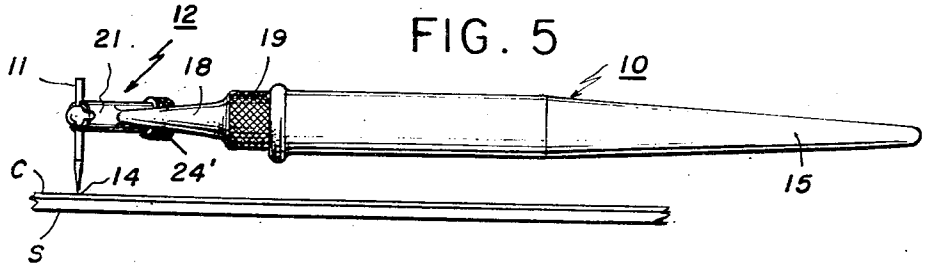


FIG. 6

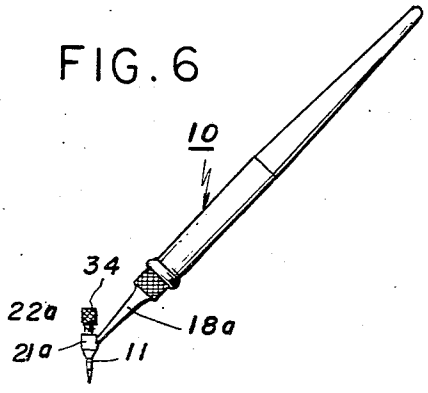
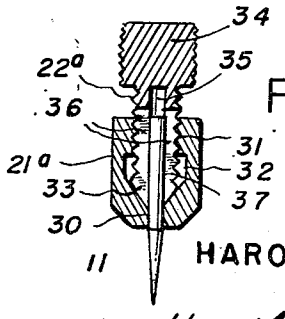


FIG. 7



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FINE LINE ENGRAVING TOOL FOR MAP MAKING

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3 Claims. (Cl. 30—164.9)

This invention relates to engraving instruments or tools used in making maps.

Since the advent of aerial photography a new and less expensive map making procedure has come into practice. Briefly stated, the new procedure is to take photographs from airplanes of the area to be mapped and these photographs are placed on a transparent glass top; and over the photographs are placed sheets of transparent acetate or similar material with a semi-transparent coating which may be scratched by suitable tools. The light beneath the table top will enable the operator to see through the coated sheet the roads, rivers, shore lines, buildings and other land-marks so that they may be reproduced or represented on the sheet by scratching off portions of the coating on the sheet by appropriate scratching tools. These scratched plastic or glass sheets are then used in the making of the desired map from which reproductions may be made.

In scratching such sheets it is necessary to scratch many very fine and irregular lines, and the present invention is a penlike tool especially adapted for freehand scribing on coated plastic or glass sheets. In the preferred form of the invention, the tool comprises a body which may be held by the fingers similar to an ordinary writing pen or grasped in the hand similar to an engraver's tool, and which has at one end clamping means to hold a straight scratching needle in various angular positions with respect to the body or hand-piece.

The principal object of the invention is to provide a fine line engraving tool in which the scratching needle is so positioned that the user of the tool will have better control of it for accurate work and the use of the tool will be less tiring since the handle need not be gripped so tightly.

Another object of the invention is to provide a tool of this character in which the needle is disposed at approximately 45° to the longitudinal axis of the body or handle for ease of use and perfect vision of the drawing surface.

Another object is to provide adjustable chuck means for clamping the needle to the body or hand-piece so that the needle will be positioned perpendicular to the coated surface to be scratched whether the tool is held like a pen holder or like an engraver's tool, and hence there will be no tendency of the tool to tilt the pointed end of the needle digging into the plastic sheet beneath the coating.

Another object is to provide the tool with an adjustable chuck in which an ordinary phonograph needle may be used as the scratching element and which will enable the draftsman or user to adjust the point to a suitable angle for his particular use.

With the above and other objects and advantages in view, the invention resides in the novel combination and arrangements of parts and the novel features of construction hereinafter described and claimed, and illustrated in the accompanying drawings which show the present preferred embodiments of the invention.

In the drawings:

Fig. 1 is a side view of the new tool showing it in an inclined upright position relative to the coated sheet to be scratched with the needle in one position of adjustment;

Fig. 2 is an enlarged vertical or longitudinal sectional view;

Fig. 3 is a detail perspective view of the metal handle extension with the outer member of the clutch thereon;

Fig. 4 is a detail perspective view of the inner member of the clutch;

Fig. 5 is another side view of the tool shown in Fig. 1 with the needle in another adjusted position, the tool being disposed substantially horizontal and parallel with the coated sheet as it would be held in the manner of an engraver's tool;

Fig. 6 is a side view of a modified form of tool; and

Fig. 7 is an enlarged vertical section through the adjustable needle clutch or clamp of the tool shown in Fig. 6.

Referring more in detail to the drawings, the numeral **10** denotes the body or hand-piece, **11** the scratching needle and **12** a suitable clamping means or chuck which fixes the needle at one end of the body. The needle may be a straight cylindrical piece of hard metal with a pointed scratching end **14**, such as an ordinary phonograph needle. The body **10** may be like the straight body or stem of an ordinary writing pen or pencil, and is shown as having a hollow cylindrical lower portion with a tapered upper portion **15** screwed into it so that the chamber **16** in the lower portion may be used to store extra needles. This elongated stem or hand-piece which may be made of plastic, hard rubber or other material, has its lower end internally screw threaded to receive a screw plug **17** at one end of a metal extension **18** which carries chuck means **12**. The extension **18** is preferably longitudinally tapered or cone-shaped and has adjacent the plug **17** an enlarged cylindrical portion **19** with a milled surface to facilitate the application and removal of the extension.

In all forms of the invention when the tool is in use, the needle will be disposed in a substantially perpendicular position relative the sheet S and its coating C shown in Figs. 1 and 5. When so held there will be no tendency of the point **14** of the needle digging into the sheet S. When the tool is held in the manner of an ordinary pen holder, the needle will be disposed at an angle of approximately 45° to the longitudinal axis A (see Fig. 1) of the body or stem **10** so that the user will have clear vision of the drawing surface or sheet. While these advantages are gained by both of the illustrated embodiments of the invention, the preferred form shown in Figs. 1–5, has the further advantages of permitting the point **14** of the needle to be disposed at or substantially at the axis A of the tool when it is used in the manner of a writing pen as seen in Fig. 1, and of permitting the needle to be adjusted to the position shown in Fig. 5 so that the tool may be used in the manner of an engraver's tool, that is, with the body **10** held by the fingers and thumb with the wrist and forearm resting on the sheet and its flat support. I have found it to be decidedly advantageous to have the needle point disposed in the axis of the body since then there is practically no tendency of the tool to wobble or tilt from side to side when the tool is held in the upright inclined position shown in Fig. 1 and pressure is applied at the needle point **14**. There is likewise no tendency of the needle to tilt or wobble when it is adjusted from the position shown in Fig. 1 to a position on either side of the tool 90° from that of Fig. 1 since the pressure applied to the perpendicular needle is directly downward, as will be apparent on reference to Fig. 5.

The preferred needle clamping or chuck means shown in Figs. 1–5, comprises an outer tubular chuck member **21** and an inner needle gripping member or bolt **22**. The member **21** is a cylindrical tube fixed between its ends to the tapered lower end of the body extension **18** and at an angle of approximately 45°. The bolt-like member or element **22** is cylindrical and has a sliding fit in the tube **21**. The bolt is longer than the tube and has at its projecting front end an opening or opening portion **23** in which the needle **11** is slidable. The projecting rear end **24** of the bolt is screw threaded to receive a milled nut **24'** adapted to abut the rear end of the tube and draw the bolt rearwardly to clamp an intermediate portion of the needle against the front end of the tube **21** and thus clamp the needle in any position radially or transversely of the axis of the tube. However the front end of the tube is preferably formed with an annular series of circumferentially spaced and radially alined notches or seats to partly receive the needle and thus prevent its shifting when clamped by the bolt. As shown one pair **25** of diametrically arranged notches are disposed in a plane which intersects the axis A of the body **10**, the axis of the tube being also disposed in that plane. Another pair **26** of the notches are at 90° from the pair **25** so that the needle may be fixed to project at right angles to a plane passing through the axis A and from either side of the body. When the needle is seated in the notches **25**, its point **14** may be positioned in the axis A, as will be understood on reference to Fig. 1, so that pressure applied to the needle will be directly downward and there will be practically no tendency of the tool to tip sidewise. When the needle is seated in the notches **26** with its point toward either side of the tool, as shown for example in Fig. 5, the tool may be held in the manner of an engraver's tool.

In the form shown in Figs. 6 and 7 the point of the needle cannot be disposed in the longitudinal axis A of the body **10** as in Fig. 1, and the longitudinal axis of the needle cannot be disposed in a plane at right angles to a plane passing through that axis of the body as in Fig. 5, but when the tool in Fig. 6 is used downward pressure on the body will move the needle downwardly in the same manner as in the forms shown in Figs. 1 and 5, since the needle is in a perpendicular position. In this modified form the tapered extension **18ª** has fixed to it at a 45° angle an outer tubular chuck member **21ª** from the lower end of which the needle projects. The bore in the tube **21ª** has a lower portion **30** of a diameter to receive the needle, an upper and larger screw threaded portion **31** and a further enlarged intermediate portion **32** with a tapered or cone-shaped lower end **33**. The inner clamping element or member **22ª** of the chuck is a screw threaded in the portion **31** and has a milled head **34** at its upper or outer end. The screw **22ª** has a central bore **35** to slidably receive the upper end of the needle, and its lower end is formed with radial slits **36** to provide a plurality of resilient needle gripping jaws **37**, the outer faces of which are tapered to coact with the cone shaped portion **33**. It will be seen upon reference to Fig. 7, that the needle **11** may be adjusted in the chuck and that when the screw **22ª** is turned into the tube **21ª**, the jaws **37** will be sprung inwardly by the cone **33** and caused to grip and hold the needle in an adjusted position.

From the foregoing, taken in connection with the accompanying drawing, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, and while preferences have been disclosed, attention is invited to the possibility of making variations within the scope of the invention as claimed:

I claim:

1. In an engraving instrument, the combination of an elongated stem, a tube fixed to the lower end of said stem and having its longitudinal axis intersecting the longitudinal axis of said stem at an angle of approximately 45°, an adjustable element slidable in said tube and of greater length than the same, one end of said element projecting beyond one end of the tube and having a transverse opening adapted to receive a straight tool with a scratching end, the other end of said element projecting beyond the other end of the tube and being screw threaded, and a nut on said screw threaded end to engage the adjacent end of the tube to slide said element and cause the tool to be clamped between said one end of the tube and the wall of said opening.

2. The instrument of claim 1 in which said element is rotatable as well as slidable in said tube and said one end of the tube has a plurality of radially alined and annularly spaced seats to receive the tool and hold it in different positions of radial adjustment with respect to the tube when the nut is tightened.

3. The instrument of claim 1 in which the outer end of the tube has a pair of radially alined seats to receive the tool and in which it is clamped by said element, said seats being in a single plane passing through the longitudinal axis of the tube and stem, and said tool and said outer end of the tube being long enough to permit the tool to be clamped with its scratching end substantially in longitudinal axis of the stem to reduce the tendency of the tool to tilt when the instrument is in use.

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