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N. J. SMITH

2,213,098

PEN FOR RECORDING INSTRUMENTS

Filed March 16, 1939

Fig. 1

Fig. 2

Fig. 3

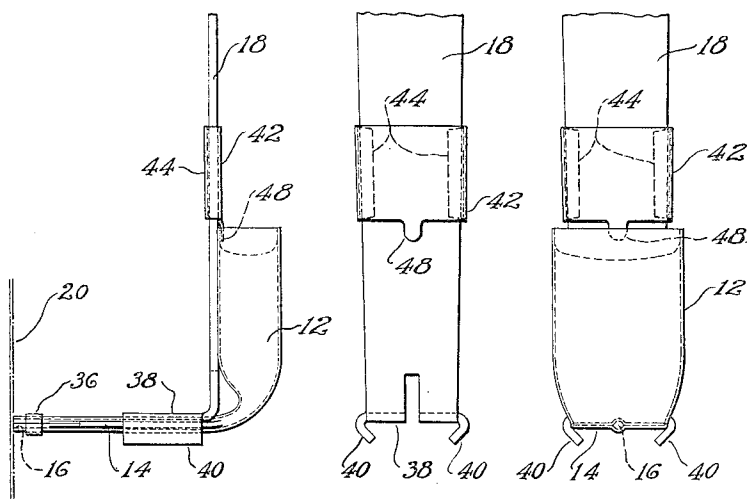


Fig. 5

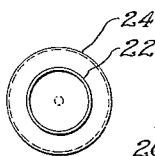


Fig. 4

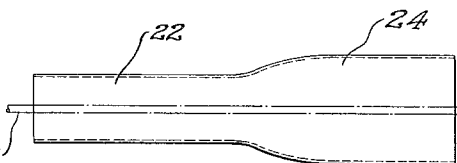


Fig. 7

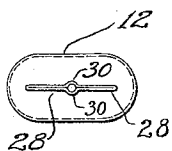


Fig. 6

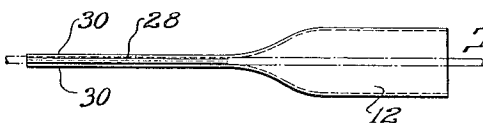


Fig. 9

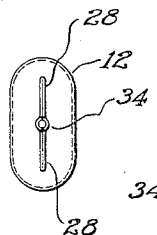


Fig. 8

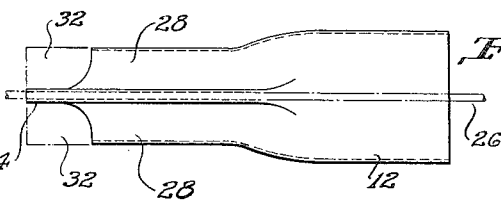
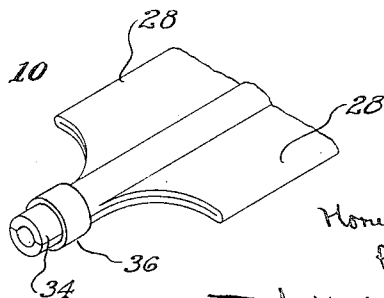


Fig. 10



Witness

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PEN FOR RECORDING INSTRUMENTS

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3 Claims. (Cl. 120—43)

The present invention relates to pens and more particularly to reservoir pens of the type used in recording instruments.

Owing to their necessarily fine bore, such pens present serious problems of manufacture and maintenance. The ink used therewith, even though carefully selected, tends to cause corrosion which results in ultimate clogging of the capillary. Stainless steel would be an excellent material for the pens, but its difficulties of working in the small sizes necessary for pen construction have prevented its use in pens of conventional manufacture.

Other features of the invention comprise the pen itself and the means used for supporting and mounting it, as will be hereinafter described and particularly defined in the claims.

In the accompanying drawing Fig. 1 is a side elevation of the pen and arm assembly according to the preferred embodiment of the present invention; Fig. 2 is a front view of the arm; Fig. 3 is a front view of the pen and arm assembly; Fig. 4 is a side elevation illustrating the initial step in manufacture of the pen; Fig. 5 is an end elevation of the parts shown in Fig. 4; Figs. 6 to 9, inclusive, are used similar to Figs. 4 and 5 illustrating subsequent steps in the manufacturing operation; and Fig. 10 is a perspective view of the end of the pen, all of the views being on a considerably enlarged scale.

As shown in Figs. 1 and 3, the pen comprises a single piece of metal, preferably stainless steel, including a vertical reservoir 12 and a horizontal portion 14 having a central capillary passage 16. The pen is mounted on an arm 18 in a manner to be hereinafter described. The end of the pen is adapted to pass in the usual manner over the surface of the chart 20.

The detail construction of the pen is best described by an explanation of the method by which it is made. A tube, preferably of stainless steel, is swaged to the shape shown in Fig. 4, having a front portion 22 of small diameter and a rear portion 24 of larger diameter. Supported concentrically in the tube is a fine wire 26 of an external diameter corresponding to the desired internal diameter of the capillary. The tube is then flattened as shown in Figs. 6 and 7, the front portion 22 being completely collapsed to form fins 28 with central portions 30 closely surrounding the wire. The rear portion 24 of the tube is flattened slightly in order to provide the reservoir 12. The front end portion of each fin is cut away by a die as indicated by the area 32, and closed by the dot-and-dash lines of Fig. 8.

The cutting action crimps the portions 30 around the wire 26, thus forming a substantially cylindrical end portion 34 with a smooth internal passage of circular cross section. The entire assembly is then bent into the shape of Fig. 1 so that the axis of the reservoir 12 is substantially perpendicular to the axis of the side of the capillary, the wire 26 being retained within the tube during the bending operation in order to prevent collapse of the passage. The wire is then withdrawn.

It will be observed that the operations are merely such as to distort the metal without requiring any substantial cold flow. The only place at which a flow of metal is necessitated is at the junction of the portions 22 and 24, and the distortion is so slight that no undue working of the metal occurs. For this reason, the present invention is particularly adapted for manufacture of pens from stainless steel, which, as is well-known, is not capable of withstanding severe cold working.

The tubular end portion 34 is preferably provided with a small sleeve 36, which is of the size to be forced onto the tubular portion by a press fit in order to prevent spreading of the ends of the tube.

The pen arm 18 is formed with a horizontal portion 38 having protruding inwardly bent wings or clips 40 to engage the flattened fin portions of the pen itself. The entire reservoir pen may be easily slipped into or out of the clips. In order to hold the reservoir closely against the arm, and also to prevent longitudinal displacement of the pen in the clips, a sliding retaining device 42 is mounted on the pen arm. The retaining device has clipped portions 44 engaging the arm and is provided with a downwardly extending tongue 48 which is received in the upper end of the reservoir.

Having thus described the invention, I claim:

1. A pen assembly for recording instruments comprising a pen arm having a portion turned at right angles, holding clips extending from the inturned portion, a pen having a tubular portion for a reservoir, and a portion extending at right angles provided with a capillary passage and flattened fins extending therefrom, the fins seated in the clips of the pen arm and retaining the tubular reservoir portion in an upright position.
2. A pen assembly for recording instruments, comprising a pen arm having a portion turned at right angles, a pen having a portion designed to bear upon the chart and an upturned reservoir portion, means for slidably connecting the op-

erating portion of the pen with the corresponding portion of the arm, and a member slidingly connected with the arm and designed to engage with the upper portion of the pen reservoir to
5 hold the latter in predetermined position upon the arm.

3. A pen assembly for recording instruments comprising a pen arm having pen positioning and guiding members at one end thereof, a pen

having a reservoir and a portion extending at substantially a right angle to said reservoir, said portion being provided with a capillary passage and fins extending laterally therefrom, said fins
5 being positioned between said positioning and guiding members, and a clip on said arm retaining said reservoir in parallel relation to said arm.

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