Dec. 8, 1936. P. A. NOME 2,063,458

PEN FOR RECORDING METERS AND THE LIKE

Filed Feb. 8, 1936

Fig. 1.

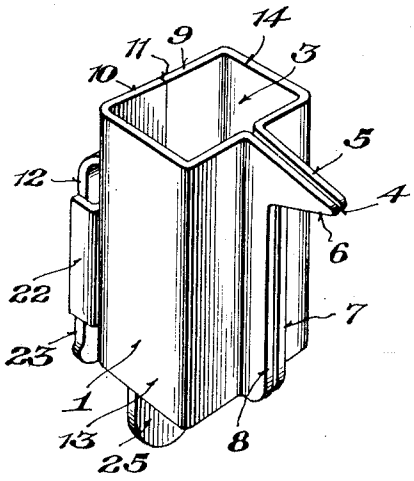


Fig. 2.

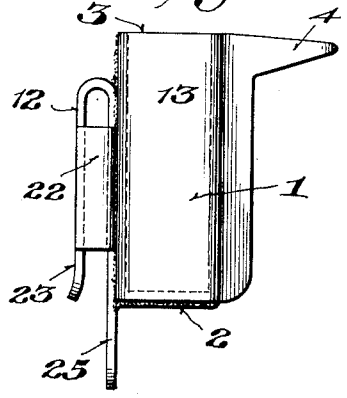


Fig. 3.

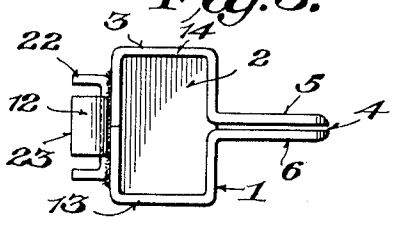


Fig. 4.

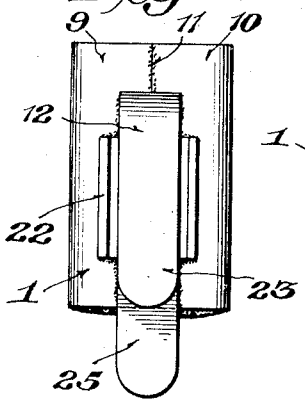


Fig. 5.

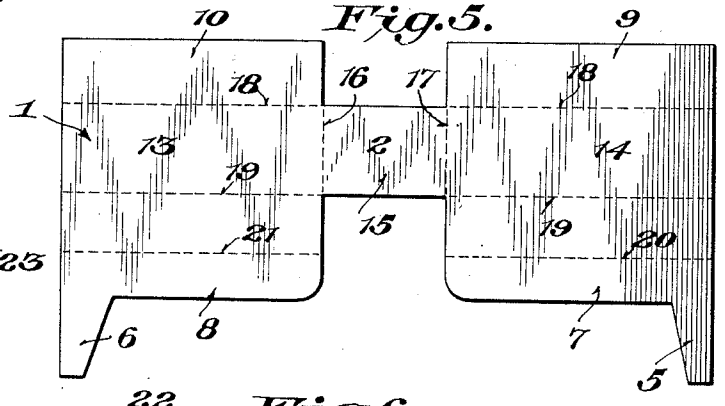
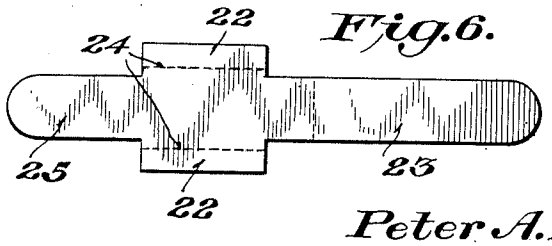


Fig. 6.



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PEN FOR RECORDING METERS AND THE LIKE

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Application February 8, 1936, Serial No. 63,036

5 Claims. (Cl. 120—43)

This invention relates to pens for recording-meters and the like; and it comprises a reservoir for ink having a filling opening at its top, closely adjacent walls forming a capillary space or slotted opening extending substantially from the bottom to the top of said reservoir and terminating at the top of the reservoir in a writing point substantially at right angles to the length of the reservoir, and means opposite the writing point for attaching the pen to a pen arm, all as more fully hereinafter set forth and as claimed.

Pens for recording-meters vary greatly in their adaptability for different instruments depending upon the nature of the record to be made and the position in which the pen is used, i. e. horizontal or vertical. For instance, a pen for a recording thermometer or barometer or the like may consist simply of a shallow pan with a grooved point because of the fact that the record to be made is a perferctly simple line without any violent and abrupt changes or vibrations. On the other hand recording pens for instruments such as carbon dioxide recorders and the like must have large ink reservoirs since these recorders are subject to violent fluctuations and the record drawn is frequently one that travels up and down rapidly in such short cycles that the up and down lines sometimes overlap resulting in large ink consumption. With some meters there is an inherent vibration causing the pen to be continuously moved so that the line drawn by the pen is of considerable overall length. In these pens large ink reservoirs are necessary and it is also important that the feed of ink from the reservoir to the pen point be maintained and feeding means kept clean and free from impurities which would otherwise clog the pen. With large reservoirs it has been difficult to provide a suitable feed to the pen point because of the distance of the point from the bottom of the reservoir and for other reasons well known in the art.

Heretofore recording pens of large reservoir capacity for use in a vertical position or for writing upon vertical chart sheets have had objectionable features such as capillary tubes for feeding ink from the reservoir to the point of the pen. It is necessary of course that the reservoir be held in a substantially vertical position in order to prevent ink from spilling and to this end the capillary tubes are bent at substantially right angles at the top of the reservoir toward the record sheet. These tubes frequently become clogged with impurities such as dust, etc., and because of their small bore and sharp right angle bend it is almost impossible to clean them and it is necessary to frequently replace the entire pen with a new one.

Other known pens employ a capillary groove to draw the ink up to the writing point, but such pens are likewise difficult to clean. Any solid impurity, such as caked dust, accumulating in the groove of such pens obstructs the flow of ink, and if any metal implement is used for cleaning the capillary groove is easily distorted which renders the pen useless.

It is an object of the present invention to provide a recording pen with a capillary slot opening in the side of the reservoir leading to the pen point for feeding ink from the reservoir to the point, the slot being so arranged that it may be easily cleaned without special tools and without danger of distorting the slot.

A further object of the invention is the construction of such a pen from a single sheet of material such as metal in a simple and convenient manner as by stamping out a blank of suitable pattern and bending it to shape over a mandrel. In order to insure against leakage and to increase the strength and rigidity of the pen, abutting edges formed in bending, with the exception of the edges forming the capillary slot, may be soldered.

A further object of the invention is the provision of a pen having a reservoir adapted to hold an ample supply of ink without permitting leakage of such ink from the reservoir due to vibrations of the recording meter.

A further object of the invention is the provision of a pen having a point which does not scratch or tear the surface of the recording chart, nor deposit excessive quantities of ink upon the recording chart, due to vibrations of the recording meter or due to severe fluctuations of the record.

I obtain these and other objects by the construction of pen illustrated in the accompanying drawing in which,

Fig. 1 is a perspective view of a pen embodying the present invention;

Fig. 2 is a view in side elevation of the same;

Fig. 3 is a top plan view;

Fig. 4 is a rear elevation;

Fig. 5 is a plan view of the metal blank or stamping from which the pen is made, with the lines of fold shown in dotted lines; and

Fig. 6 is a plan view of the metal blank or stamping from which the pen arm clip is made with the lines of fold shown in dotted lines.

Referring to the drawing wherein like reference numerals indicate corresponding parts throughout the several views, I have shown for

purposes of illustration, a preferred embodiment of the invention in which the numeral 1 designates the ink receiving or reservoir portion of the pen. This may be of rectangular cross sectional shape as shown or it may, if desired be cylindrical or of any other convenient configuration.

The reservoir is closed at the bottom as at 2 and open at the top 3 to receive ink. Near its top, or preferably at its top as shown, and projecting from one side thereof is the point 4 of the pen which is formed by substantially parallel closely abutting extensions 5 and 6 of flanges 7 and 8 respectively, formed on the walls of the reservoir as will presently be described. The space between these flanges is of capillary dimension in the order of two to ten one-thousandths of an inch in width and extends from the top of the reservoir to its bottom so that a thin piece of paper may be inserted at the top of the reservoir between the flanges and drawn their entire length to remove impurities or foreign matter which may accumulate in the slot. This slot serves to feed the ink from the reservoir to the point of the pen. Opposite the slot or at the rear of the reservoir are corresponding abutting edges 9 and 10 of the walls of the reservoir. These are soldered together as at 11. A pen arm clip 12 for attaching the pen to the arm of a recording instrument in soldered to the back.

A slot formed between relatively wide adjacent parallel plates and of a width as specified above does not permit unwanted escape of the ink from the reservoir even when the recording meter is subject to severe vibrations, nor do such vibrations cause a feeding of excessive quantities of ink upon the paper by the pen point provided the latter is arranged near the top of the capillary slot, as shown.

Both the pen and the clip are formed from stamped sheet metal. The blank for the pen is shown in Fig. 5 and consists of two complementary rectangular shaped portions 13 and 14, joined by an intermediate portion 15 of reduced width. This intermediate portion forms the bottom of the reservoir when the blank is folded or bent to form the pen and the two complementary rectangular shaped portions form the sides of the reservoir. However, the reduced intermediate portion is not centered as regards the overall width of the blank so that the complementary rectangular shaped portions are wider on one side of the reduced portion than on the other, a distance equal to the width of flanges 7 and 8 above described. In forming the reservoir these flanges are first bent downwardly at right angles along lines 20 and 21 and the sides of the complementary portions are then bent upwardly toward each other at right angles along lines 18 and 19. Thereupon the two complementary portions are bent toward each other along lines 16 and 17, until edges 9 and 10 meet and flanges 7 and 8 are substantially parallel. Flanges 7 and 8 then form two parallel plates of substantial width on the outside of the reservoir, extending from the bottom to the top and spaced apart to form a capillary slot therebetween. The capillary opening so formed, of large area due to the width of these flanges, is not readily subject to clogging by foreign matter and therefore delivers an ample supply of ink to the pen point at all times. Projections 5 and 6 on flanges 7 and 8 respectively form the point of the pen when the blank is folded as clearly shown in the drawing, and this point is then rounded off in the form of a half ball (see Figs. 2 and 3) so as to slide smoothly over the recording chart without tearing or scratching its surface.

The metal stamping for the pen clip is shown in Fig. 6 and is shaped like a cross with two short extending arms 22 projecting from either side of an elongated portion 23 at a point about one-third of its length from one end. These short extensions are adapted to be bent along dotted fold lines 24 toward each other into substantially parallel position and the short end 25 of the elongated portion is curved or bent forwardly upon itself to rest in the space formed between the two short extensions. The space or recess formed between the short extensions is of substantially the same cross sectional dimension as the cross sectional dimension of the pen arm with which the clip is adapted to engage and the curved short end bent over and pressed within the recess serves both as a friction clamp, securing the pen to the pen arm, and as a stop for definitely positioning the pen on the arm.

As hereinbefore stated, the pen arm clip may be soldered to the rear of the reservoir simultaneously with the soldering of abutting edges 9 and 10 of the rear wall of the reservoir. The bottom of the reservoir 2 is also advantageously soldered where it contacts with the bent-in side walls of the reservoir.

The pen may be made of brass or bronze and chromium plated upon assembly, the hard coating of chromium enhancing the wearing qualities of the pen point.

The recording pen herein described is strong and durable in use, simple in design and construction and may be manufactured at low cost. Since the feed from the reservoir to the pen point may be readily cleaned, the pen should last indefinitely.

What I claim is:—

1. A pen for recording-meters and the like comprising a reservoir for ink closed at the bottom and having a filling opening at its top, closely adjacent walls of said reservoir forming a capillary slotted opening extending substantially from the bottom to the top of the reservoir, outwardly projecting extensions of said walls forming a pen point above the bottom of said reservoir and means for attaching the pen to the pen arm of a recording meter.

2. A pen for recording-meters and the like comprising a reservoir for ink, said reservoir being closed at the bottom and open at the top, closely adjacent walls of said reservoir forming a capillary slotted opening extending substantially from the bottom to the top of said reservoir, outwardly projecting extensions of said walls forming a pen point near the top of said reservoir and means for securing the pen to the pen arm of a recording meter.

3. A pen for recording-meters and the like comprising a reservoir for ink, said reservoir being closed at the bottom and open at the top, closely adjacent walls of said reservoir forming a capillary slotted opening extending substantially from the bottom to the top of said reservoir, outwardly projecting extensions of said walls forming a pen point located at the top of the reservoir and means for securing the pen to the pen arm of a recording meter.

4. A pen for recording-meters and the like comprising vertically extending sides forming a reservoir for ink, said reservoir having a filling opening at its top, one of said sides of said reservoir defining a substantially vertical capillary opening and a pen point formed on said reservoir

above the bottom thereof adapted to receive ink from said capillary opening.

5. A pen for recording-meters and the like comprising a reservoir for ink, said reservoir being closed at the bottom and open at the top, a vertical slot in said reservoir, a pair of parallel plates extending at right angles from the reservoir, a capillary space formed between said plates, said space being two to ten one-thousandths of an inch in width and communicating with said slot, a pair of adjacent projections from said plates, said projections being located above the bottom of the reservoir and having their ends rounded off to form a half-ball shaped pen point, and means for securing the pen to a pen arm of a recording meter.

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