

Nov. 8, 1932.

W. H. PEARCE

1,887,186

ONE-PIECE METAL FOUNTAIN PEN

Filed Jan. 24, 1931

FIG. I.

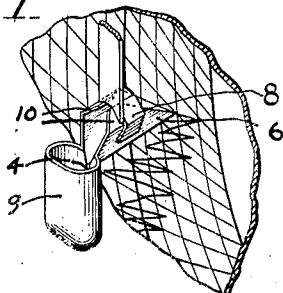


FIG. II.

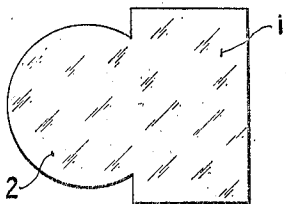


FIG. III.



FIG. IV.

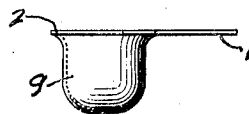


FIG. V.

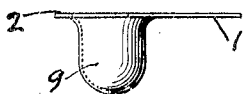


FIG. VI.

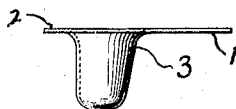


FIG. VII.

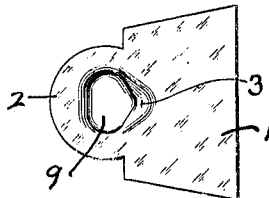


FIG. VIII.

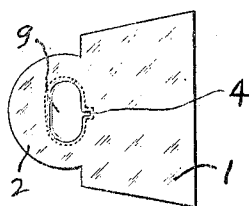


FIG. IX.

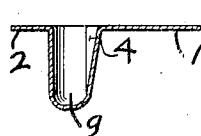


FIG. X.

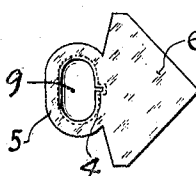


FIG. XI.

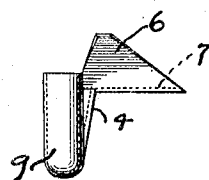


FIG. XII.

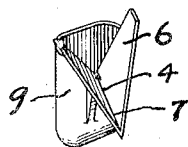


FIG. XIII.

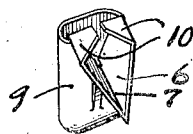
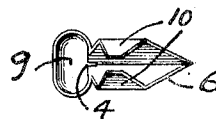


FIG. XIV.



INVENTOR.
Walter H. Pearce,
BY John E. Hubbell
ATTORNEY

UNITED STATES PATENT OFFICE

WALTER H. PEARCE, OF CHURCHVILLE, PENNSYLVANIA, ASSIGNOR TO THE BROWN INSTRUMENT COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

ONE-PIECE METAL FOUNTAIN PEN

Application filed January 24, 1931. Serial No. 510,952.

This invention relates to fountain pens for recorders.

Recording instruments such as circular chart recorders for pressure, temperature, and other quantities employ, usually, a pen arm pivoted adjacent the edge of a chart carrying a pen at its extremity which marks the position of the pen arm upon the chart. Such pens must be of the fountain type and of considerable capacity in order that the service of filling them be reduced to a minimum. In addition, such pens must be of a construction such that they can be readily filled when necessary. Such pens must also provide a continuous flow of ink for a long period of time.

Heretofore pens for this use have been constructed with a bucket part for containing the ink and a pen part for marking upon the chart, the two being held in some kind of support, and a capillary wire provided to carry ink from the bucket to the pen point. Such pens are necessarily complicated in construction making them expensive to manufacture, liable to get out of order, difficult to clean, difficult to fill, and easily destroyed by corrosion.

It is the object of this invention to provide a novel pen, which will have the maximum accessibility for refilling, which will provide a continuous flow of ink, which will be practically indestructible, which will be substantially unaffected by corrosion, which will be cheap and easy to make. Other objects and advantages of the invention will appear in the following detailed description taken in connection with the accompanying drawing, in which

Fig. 1 shows in perspective the pen of this invention associated with a chart and pen arm,

Figures 2 to 14 inclusive, show in plan, elevation, and perspective the successive steps followed in the manufacture of the pen of this invention.

The pen is formed from a flat sheet metal blank 1 having the form shown in Fig. 2. The cup portion or bucket 9 of the pen is formed by drawing the metal of the circular portion 2 of the blank. The successive steps

of drawing the metal are shown in Figures 3, 4, and 5, the metal being forced into the shape shown in those figures by a suitable tool, the shaping of the metal taking place in successive steps so as not to tear the metal. The blank in the form shown in Fig. 5 is then further drawn by the use of a suitable tool to the shape shown in Figures 6 and 7, that is, by distorting the cup or bucket 9 from its circular conformation to that having a bulge at one side as indicated at 3 in Figures 6 and 7. The bulge 3 is the first forming step for a capillary channel which extends into the bucket 9 and serves as a path for supplying the ink from the bucket to the pen point. The metal indicated by the numeral 3 is then pinched or pressed together to form the capillary channel indicated by the numeral 4 in Figures 8 and 9, a further drawing operation upon the cup being effected at the same time. The blank as shown in Figures 8 and 9 is then trimmed to the shape shown in Fig. 10, leaving a collar 5 around the mouth of the bucket and the pen blank 6. In the next operation the pen blank 6 is bent along its line of symmetry 7 as shown in Fig. 11, and at the same time the collar 5 is straightened or drawn upwardly so as to form a continuation of the bucket 9. In thus shaping the collar 5 and point blank 6 simultaneously, a joint is formed between the point and the bucket which has extraordinary rigidity inasmuch as the point meets the bucket at several different angles thereby making for rigidity. The line 7 upon which the point blank 6 is bent to form the base of the V, leads to the capillary channel 4 so that a continuous capillary path is provided from the bottom of the well to the tip of the pen point which will effectively transfer the ink from the well to the paper until the well is completely exhausted. The metal of the pen may be annealed at various times in the forming process to prevent crystallization and consequent breaking of the metal. It has been found satisfactory to anneal the blank of Fig. 2 and to anneal the form of Fig. 7.

The pen as shown in Figures 11 and 12 is completed insofar as its ink supplying func-

tion is concerned; however, in order to provide for the attachment of the pen to the pen arm it is found desirable to bend the wings 10 of the pen point inwardly as indicated in Figures 13 and 14, thereby forming the pen point with a cross section in approximate diamond shape. Thus the pen point provides for mounting the pen upon the pen arm as shown in Fig. 1, the pen arm being provided with a clip 8 which fits over the wings and sides of the pen point to hold the pen in place.

As will be observed in Fig. 1, wherein the pen is shown carried upon the pen arm and contacting with the chart to make a record thereon, it is obvious that the bucket provides a large capacity for ink, making unnecessary frequent renewals; that the bucket may be readily filled; that an unbroken capillary path of feeding the ink from the bucket to the pen tip is provided which will supply the ink continuously so long as any remains in the bucket; that a strong rigid construction of one piece, which is practically indestructible, is provided; that the one piece of metal formed into the pen provides not only the ink supplying function but also the function of mounting it upon the pen arm. Inasmuch as the pen is made from a single blank of sheet metal by a series of pressing and bending operations, it is clear that a pen inexpensive to make having all the desirable characteristics of a pen for recording instruments, has been provided.

While the pen has been described as made from sheet metal it is obvious that the operating advantages of the completed pen are not inherently dependent upon the use of metal in the pen. Accordingly, this invention includes pens having the structural features set forth in the claims which are made of materials other than metal, such, for example, as pens made from materials such as a phenol or synthetic resin, celluloid, casein, et cetera.

Modifications in the details of construction may be made without departing from the spirit and scope of the invention, as will be apparent to one skilled in the art.

Having disclosed my invention, what I claim is as follows:

1. A pen for recorders having a bucket, a point joining the upper portion of said bucket at an angle, means whereby the pen may be supported from a pen arm with the bucket substantially upright in all pen arm positions, capillary means extending from said point downward into said bucket and leading to said point, said pen consisting of one piece of material.

2. A pen for recorders, having a bucket, a point joining the upper portion of said bucket at an angle, said point being shaped for mounting on a pen arm with the bucket in a substantially upright position for all pen

arm positions, a capillary means extending from said point downward into said bucket and leading to said point, said pen consisting of one piece of material.

3. A pen for recorders having a bucket, a V-point joining the upper portion of said bucket at an angle, means whereby the pen may be supported from a pen arm with the bucket substantially upright in all pen arm positions, there being a capillary groove formed in the bucket wall leading to the bottom of the channel in the point and communicating at its upper end with said channel, said pen consisting of one piece of metal.

4. A pen for recorders having a bucket, a V-point joining said bucket at substantially right angles, said point being shaped for mounting on a pen arm with the bucket in a substantially upright position, there being an inclined capillary groove formed in the bucket wall leading to the bottom of the channel in the point and communicating at its upper end with said channel, said pen consisting of one piece of metal.

5. A recording instrument pen consisting of a single piece of sheet metal shaped to form a relatively deep bucket slightly flattened in cross-section and an integral point having a V-shaped channel formed in the bottom thereof and extending substantially at right angles from one side wall of said bucket, said pen being arranged for connection to a pen arm with said bucket in a substantially upright position, and said bucket having an inclined capillary groove formed in said side wall and leading from the lower part of said bucket to the inner end of said point channel.

In testimony whereof I affix my signature.
WALTER H. PEARCE.

CERTIFICATE OF CORRECTION.

3

Patent No. 1,887,186.

November 8, 1932.

WALTER H. PEARCE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 58 and 68, claims 1 and 2 respectively, for "leading" read "at an angle; lines 76 and 86, claims 3 and 4 respectively, for "leading" read "and arranged to an angle" and line 81, claim 4, after "joining" insert the words "the upper portion of"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of January A. D. 1933.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.