(No Model.) 2 Sheets—Sheet 1.

S. A. DE NORMANVILLE.

FOUNTAIN PEN.

No. 396,547. Patented Jan. 22, 1889.

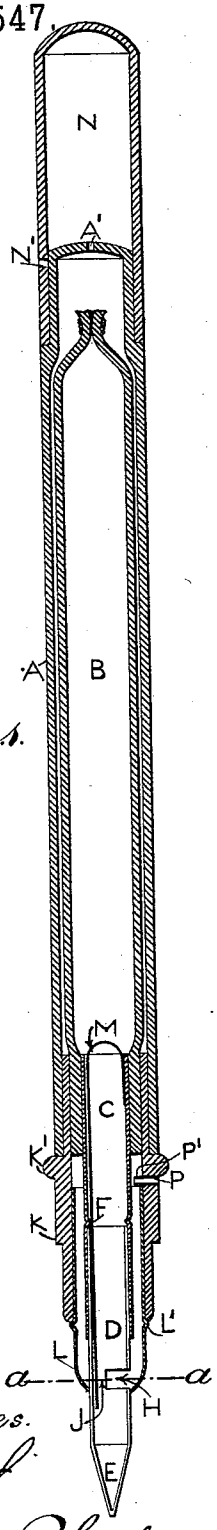


Fig. 1.

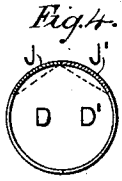


Fig. 4.

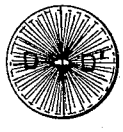
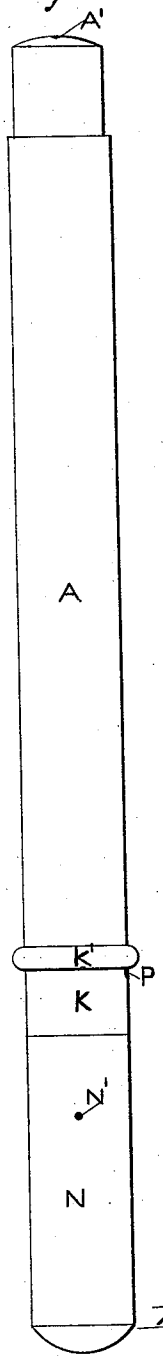


Fig. 3.

Fig. 2.



Witnesses.
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A. B. Blackwood.

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(No Model.) 2 Sheets—Sheet 2.

S. A. DE NORMANVILLE.

FOUNTAIN PEN.

No. 396,547. Patented Jan. 22, 1889.

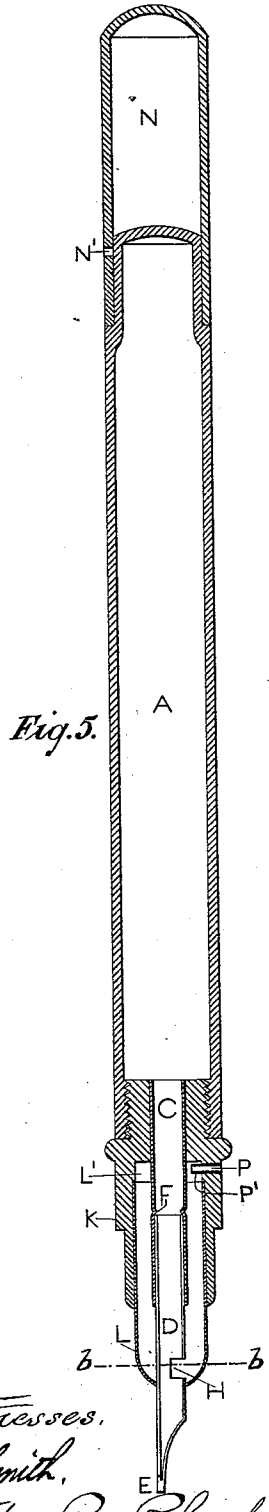


Fig. 5.

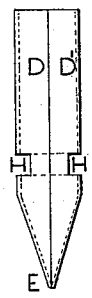


Fig. 11.

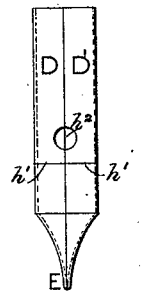


Fig. 13.

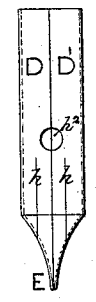


Fig. 15.

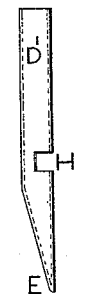


Fig. 10.

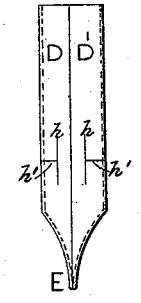


Fig. 12.

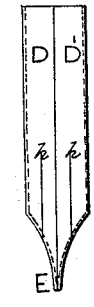


Fig. 14.



Fig. 9.

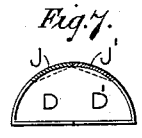


Fig. 7.

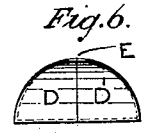


Fig. 6.

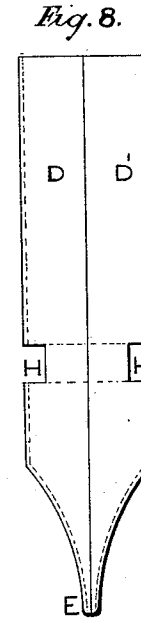


Fig. 8.



Fig. 16.

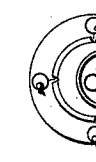


Fig. 17.

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UNITED STATES PATENT OFFICE.

SAMUEL AUGUSTINE DE NORMANVILLE, OF KENSINGTON, COUNTY OF MIDDLESEX, ENGLAND.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 396,547, dated January 22, 1889.

Application filed December 20, 1887. Serial No. 258,523. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL AUGUSTINE DE NORMANVILLE, a subject of the Queen of Great Britain, residing at Kensington, in the county of Middlesex, England, have invented certain new and useful Improvements in Fountain-Pens; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

The object of my invention is the construction of an improved fountain or reservoir pen, in which certain objections more or less attendant on such pens as heretofore usually constructed are overcome. Such objections consist, mainly, first, in the formation of a dry space at or near the end of the writing-point when a pen is not in use, which causes difficulty in commencing to write, this difficulty arising principally in those pens making use of a flexible nib, from the necessity of allowing the points of the nib to project beyond the actual ink-containing parts of the instrument; secondly, in the necessity for the use of a separate instrument for filling the reservoir; and, thirdly, in the want of some effective means of dealing with the overflow of ink caused by expansion of the contained air, due to increase of temperature.

The principal parts of my improved fountain or reservoir pen are an elastic reservoir inclosed in a tube or case, an ink-supply tube, a writing-nib, a cap to retain an overflow of ink, an outer hood or cover to protect the nib when not in use, and in certain cases a short wire within the writing-nib and supply-tube; but I do not necessarily combine the whole of these parts in the same pen, as will be hereinafter explained.

In the accompanying two sheets of drawings, Figure 1 is a longitudinal section about twice the actual size of a pen constructed according to one method of carrying out my invention, and with the nib exposed for use. Fig. 2 is an external view of the pen when closed. Figs. 3 and 4 represent, respectively, to an enlarged scale, an end view of the writing-nib and a cross-section of the same through the line *a a* in Fig. 1. Fig. 5 is a longitudinal section of a pen constructed according to my invention in a modified form; and Figs. 6, 7, and 8 represent, respectively, to an enlarged scale, an end view of the form of writing-nib used in such modified pen, a cross-section of the same through the line *b b* in Fig. 5, and a plan of the upper side. Figs. 9 to 15 represent views to about twice the natural size of nibs, showing further modifications in form; and Figs. 16 and 17 are detached views of the nozzle K in Fig. 5.

Similar letters of reference are used to denote similar or corresponding parts throughout the figures.

Referring to Figs. 1, 2, 3, and 4, the outer case is a thin tube, A, closed at one end. A tubular elastic reservoir, B, also closed at one end, is contained within the case A. A small hole, A′, may be provided in the case A to allow for the passage of air on inserting or withdrawing the reservoir B. An ink-supply tube, C, is securely fixed within the open end of the reservoir B.

The pen proper, which is one of the principal features of my invention, is formed of two members, D D′, each consisting of a half-tube of semicircular section and of equal or parallel dimensions for the greater part of their length, but tapered to a point for the remaining part, so that when these two half-tubes are brought together they form an inclosed tube having a cylindrical part which fits securely into the tube C and a conical part, E, tapering to a point, consisting of two independent members, which form the actual writing-nibs.

A ledge, F, is provided in the tube C to prevent the nibs D D′ being pushed too far into the tube C; but a shoulder may be formed on the nibs or any other suitable device employed to effect the same purpose.

The nibs D D′, as at present described, would possess little or no elasticity and no separating movement when writing. To provide these requirements, I cut a transverse slot, H, into the half-tubes D D′ at right angles to their longitudinal plane of conjunction. This slot is of such width and depth as to leave intact in each piece a short slip, J J′, of curved section of sufficient length and width to give the required elasticity, and the chords of the said curved slips, as represented by dotted

lines in Fig. 4, being inclined to each other, the aforesaid required separating movement, when writing, is obtained in a manner well understood in the construction of writing-nibs.

The removable end K of the case A has the end of the reservoir B containing the tube C fitted into it, and a tubular cap, L, fits into the outer end of the piece K, a shoulder, L′, being formed on the said cap to abut against the edge of the piece K. The nibs D D′ project through an opening in the outer end of the said cap L, so formed as to fit around them with moderate tightness, and the length of the cap is such that when pushed in to the shoulder L′, as shown, the slot H is just within it.

A short wire, M, having its end bent round, is pushed into the tube C as far as the commencement of the reservoir B and held therein by the spring of its bent end. The other end of the wire is contained within the nibs D D′ and reaches below the slot H.

A projecting hood or cover, N, is fitted over the nibs when not in use, as shown in Fig. 2, such cover being fitted on the other end of the pen when writing, as shown in Fig. 1, after the method usually adopted in reservoir-pens. A perforation, N′, for the escape of air is provided in this cover, preferably on the side of same at such a point that it is closed by the advancing edge of K just as the cover is pushed fully home.

The action of the apparatus is as follows: To fill the pen, the piece K, with the nibs D D′, cap L, and reservoir B attached, is taken from the case A and the cap L removed. The nibs are dipped into ink, submerging the slot H, the reservoir squeezed, and then released, when the ink will rise therein in a manner well understood. Reservoir-pens have heretofore been constructed with elastic reservoirs to be filled in this manner, and I therefore lay no separate claim to such particular action. When the reservoir is filled, the cap L is replaced and the reservoir, &c., returned to the case A, and the pen is ready for use.

The slot H not only furnishes the nibs D D′ with the required elasticity, but it forms the opening for admission of air to the reservoir B to supply the place of ink withdrawn in writing. The ink is supplied to the nib-points by the pressure of the column extending from the said points to the slot H. As soon as this column is slightly reduced in height by the action of writing, an air-bubble enters the slot and rises to the top of the reservoir, while an equivalent amount of ink descends. The air finds its way to the opening H through a perforation, P, in the piece K, and this perforation is preferably provided with a short inwardly-projecting tube, P′, which acts as a trap to prevent the escape of any ink which may find its way into the piece K.

The use of the wire M, which should lie against one side of the tube C, is to provide angular capillary passages to insure the descent of the ink without interfering with the ascent of an air-bubble.

When the air in the reservoir becomes heated, some ink may be expelled from the slot H, but will remain in the cap L until from contraction of the air it is drawn again into the reservoir, or if the pen is in use such ink will flow down into the nibs. In any case no ink can escape from the pen and cause annoyance by soiling the fingers or pocket or interior of the cover N.

If desired, the writing-nibs D D′ may be made to project eccentrically from the cap L instead of centrally, as shown, so that the correct way of holding the instrument will be manifest thereby.

In the modified form of pen shown in Figs. 5, 6, 7, and 8 the apparatus, though still adhering to the essential principles of my invention, as above described, is simplified in construction, the elastic reservoir B being dispensed with, while the nibs resemble in appearance an ordinary writing-nib. The case A forms the ink-reservoir. It is closed at the upper end and has a tubular nozzle, K, screwed into the lower end. This nozzle carries the overflow-cap L, and has the ink-supply tube C fitted into it, which carries the nibs D D′. A ledge, F, is provided to prevent the nibs being pushed too far into the tube C; but a shoulder may be formed on the nibs instead, if preferred. The cap L may abut against a ledge, L′, or may be provided with an external shoulder, as shown in Fig. 1. The nibs when placed together form a closed semicircle in cross-section, as shown in Figs. 6 and 7, for the greater part of their length, while the outer end is the same shape as an ordinary nib, as shown clearly in Figs. 5 and 8, with the exception that it forms a closed chamber up to the extreme point. The reservoir A is filled by unscrewing the nozzle K and pouring in ink. With this exception the mode of using the instrument and its novel action are precisely the same as that described in connection with the pen shown in Figs. 1, 2, 3, and 4.

In practice I prefer the form of nibs shown in Figs. 5, 6, 7, and 8, and such nibs may advantageously be fitted to the previously-described pen; but I may make the split tube and nibs of a flattened triangular form in section or of a diamond or lozenge form in section. In all such cases the half-tubes will be slotted across in such manner that the portions left uncut will have their planes (if plane) or their chords (if of curved section) inclined to each other in the manner and for the purposes before described.

Fig. 9 is a cross-section through the slot H, Fig. 10 is a side elevation, and Fig. 11 a plan, of a nib of flattened triangular form, its principles of construction being identical with those previously shown and described. The nibs may be merely split for the bending and separating movement and an air-hole pro-

vided separately, instead of combining both these functions in a slot, H, and such splits may be either parallel with the main division or transverse, or a combination of these, as long as the chambered nibs are left supported on flexible slips of suitable elasticity and inclined to each other, as before described.

Fig. 12 is a plan of the top, and Fig. 13 a plan of the under side, of a nib having parallel longitudinal slits *h h* on the top and transverse slits *h' h'* on both the top and under side to give the required elasticity and separating action, while the air is admitted through a hole, h^2. Fig. 14 is a plan of the top, and Fig. 15 a plan of the under side, of a nib having parallel longitudinal slits *h h* in both the top and under side, an air-hole, h^2, being provided, as in the previous figures. In nibs constructed in this manner the wire M may sometimes be dispensed with, as the internal angles of the tube and nibs form capillary passages for the descent of the ink, while the air-bubbles pass up in the center.

The two members D D' of the writing-nib, although described as made separately, may, if desired, be united at their inner ends and fitted directly into the mouth of the elastic reservoir B in Fig. 1 or into the tubular nozzle K in Fig. 5, thus dispensing with the necessity of the tube C.

My improved writing-nib may be made with slits only, as shown in Figs. 12 and 14, and without any air-hole h^2, and in this form can be fitted to an ink-reservoir wherein the air is admitted through a central tube fixed in the upper end of the said reservoir and terminating within the nibs at the same place as the slot H or air-hole h^2 would be formed. Such central air-tube is a well-known device in connection with reservoir-pens.

The overflow-cap L may be applied to reservoir-pens fitted with ordinary writing-nibs and an ink-supply tube with an air-hole in the lower part of such tube by causing it to inclose the tube and nib just below the level of the said air-hole, the opening in the end of the said cap being modified to suit the form of the particular nib and tube to which it may be applied.

The flexibility of the nibs is controllable to a certain extent by slightly withdrawing the cap L, so as to embrace them at a lower point. The best position of the slot H varies according to the internal caliber of the nibs, being farther from the writing-point in nibs of smaller caliber.

As shown in Figs. 16 and 17, which are a part elevation and end view, respectively, of the nozzle K, one or more grooves, Q, may be cut across the screw-threads of the nozzle to allow any ink which collects in the threads to pass into the reservoir instead of being squeezed out of the joint when screwing the said nozzle into place.

The main advantages of my improved pen may be summarized as follows: On account of the peculiar chambered form of the nibs they are always kept wet internally to the extreme ends, so that the pen starts writing at once, as before described, while the pen may be laid or carried in any position without fear of an escape of ink. There are no valves requiring to be opened before writing and liable to clog or get out of order, and the pen is easily cleaned by dipping the nibs in water and squeezing the elastic reservoir (when this is employed) a few times, while the interior of the actual writing portion is readily accessible by removing the cap L and then withdrawing the two halves D D' of the nib from the tube C.

I make no claim to the use of any special form of reservoir or holder in the construction of my improved fountain-pens; but

What I do claim, and desire to secure by Letters Patent, is—

1. In a fountain-pen, the combination, with the ink-reservoir, of a writing-nib composed of two substantially half-tubular sections joined edge to edge and fitted in a reservoir, the outer ends of both sections projecting the same distance from the reservoir and being tapered to equal degree, so as to meet and form a point, substantially as described.

2. In a fountain-pen, a writing-nib consisting of two half-tubes of equal length and size, both tapering at one end to equal degree and fitted together edge to edge throughout their entire lengths, substantially as described.

3. In a fountain-pen, the combination, with a reservoir in the handle of the pen and a supplementary reservoir, K, fitted to said handle, of a tubular cap, L, closing the end of said reservoir, and a writing-point passing through a hole in the end of said cap, substantially as described.

4. In a fountain-pen, the combination, with reservoir B, supplementary reservoir K, and cap L, closing the end of said reservoir K, of tubular writing-nib D, projecting through said reservoir K, and having an opening, H, within said cap, substantially as described.

5. In a fountain-pen, the combination, with elastic reservoir B and casing A, inclosing said reservoir and having hole A', of ink-supply tube C and writing-point D, all constructed and arranged substantially as described.

6. In a fountain-pen, the combination, with reservoir B, supply-tube C, and writing-point D, communicating with said reservoir and having slot H, of supplementary reservoir K, having port P, and cap L, embracing said writing-point and closing the end of reservoir K, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of November, 1887.

SAMUEL AUGUSTINE DE NORMANVILLE.

Witnesses:
HARRY KING,
H. G. BISHOP.