

(No Model.)

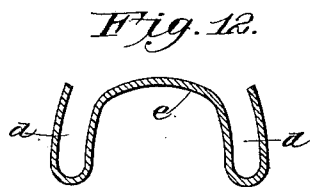
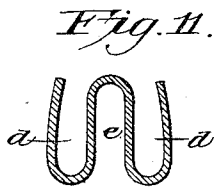
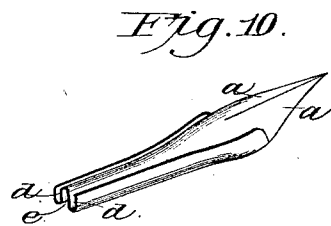
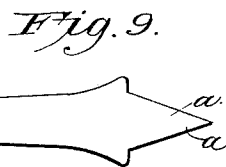
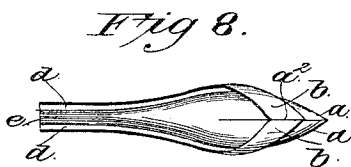
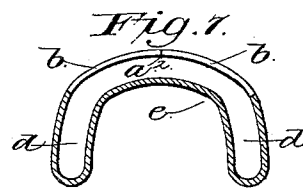
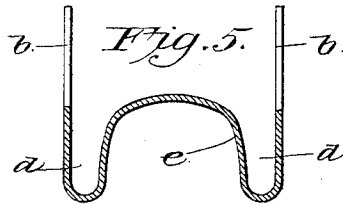
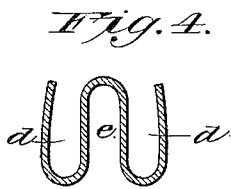
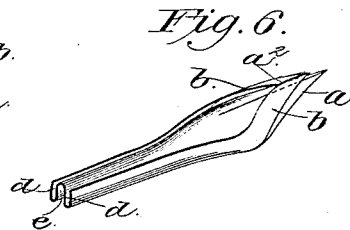
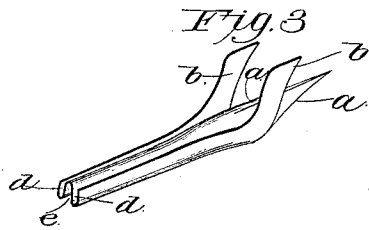
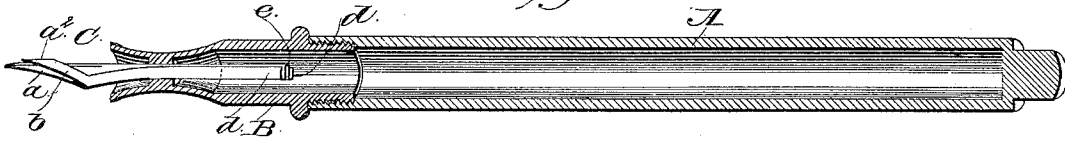
2 Sheets—Sheet 1.

P. E. WIRT.
FOUNTAIN PEN.

No. 399,306.

Patented Mar. 12, 1889.

Fig. 1.



Witnesses.

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Fig. 13.



Fig. 14.

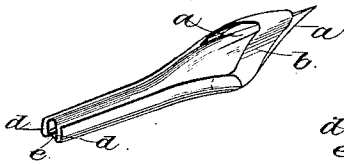


Fig. 15.

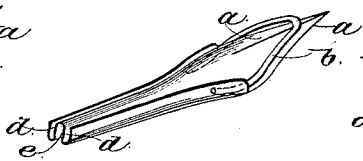


Fig. 16.

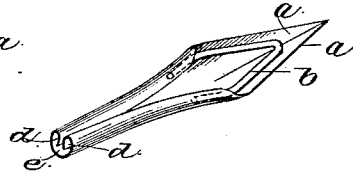


Fig. 17.

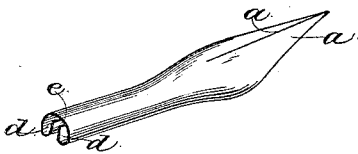


Fig. 18.

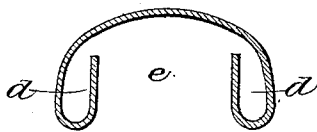


Fig. 19.

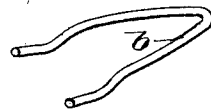


Fig. 20.

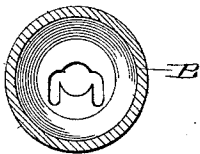


Fig. 21.

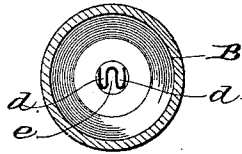


Fig. 22.

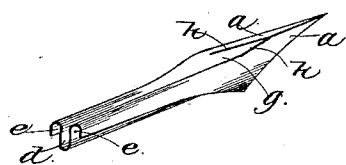


Fig. 23.

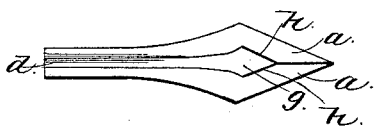


Fig. 24.



Witnesses
M. Fowler
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Inventor,
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by *C. Snowdon*
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UNITED STATES PATENT OFFICE.

PAUL E. WIRT, OF BLOOMSBURG, PENNSYLVANIA.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 399,306, dated March 12, 1889.

Application filed March 16, 1888. Serial No. 267,428. (No model.)

To all whom it may concern:

Be it known that I, PAUL E. WIRT, a citizen of the United States, residing at Bloomsburg, in the county of Columbia and State of Pennsylvania, have invented a new and useful Improvement in Fountain-Pens, of which the following is a specification.

My invention relates to fountain-pens; and it has for its object to simplify the construction of such articles, reduce the working parts thereof to a minimum, cheapen the cost of production, and at the same time provide a pen that will be superior to all others in reliability, durability, and efficiency.

Fountain-pens are constructed to work on the principle of capillary attraction. Heretofore all fountain-pens, so far as I am aware, have employed capillary wires, rods, tongues, or shafts to attract the ink from the reservoir or holder to the pen. An instance of this use may be found upon reference to one of my former patents, No. 311,554, dated February 3, 1885. To effect the object, as hereinbefore stated, I propose to dispense with these supplemental appendages in the shape of connecting rods, wires, or shafts, and in lieu thereof provide a specially-constructed pen having capillary ducts or grooves, which ducts or grooves are so constructed that they of themselves will afford sufficient capillary attraction to draw the ink out of the reservoir or holder and feed it to the pen.

I have illustrated in the accompanying drawings various forms in which I may embody my invention; but it should be distinctly understood that I do not limit myself to mere matters of form, size, proportion, or minor details of construction, as such matters will readily suggest themselves to the skillful mechanic.

In said drawings, Figure 1 is a longitudinal section of a fountain-pen holder of ordinary construction having my improvements applied thereto. Fig. 2 is a detail view of the blank from which the pen is made. Fig. 3 is a detail view of the pen after it leaves the dies. Fig. 4 is a cross-sectional view taken on the heel of the pen. Fig. 5 is a similar view taken at the shoulder of the pen. Fig. 6 is a detail perspective view of the pen in its com-

pleted form. Fig. 7 is a detail cross-section taken at the shoulders of pen after the tongues are bent together over the pen. Fig. 8 is a plan view of the same. Fig. 9 is a detail view of a blank from which a modified form of the pen is made. Fig. 10 is a perspective view of the modified form complete. Figs. 11 and 12 are transverse sections of the same, taken at the heel and shoulder, respectively. Fig. 13 is a detail view of the tongue-piece detached. Fig. 14 is a perspective view of the pen, showing the tongue-piece applied. Fig. 15 is a detail view of the pen, showing a modified form of tongue-piece. Figs. 16 to 19 represent detail views of another modified form of my pen, in which the ducts and the tongue-piece are located on the under side of the pen. Figs. 20 and 21 represent cross-sectional views showing different modes of holding the shank of the pen in place when a narrow or wide shank is employed. Figs. 22, 23, and 24 represent detail views of another modification.

Referring to the drawings, A designates the hard-rubber holder, case, barrel, or reservoir, having the usual removable hard-rubber nozzle or pen-section, B. These parts are of the usual construction, the nozzle itself being constructed on the plan of the nozzle shown in my former patent hereinbefore referred to.

C designates the pen, which is of a peculiar and novel construction and on which I lay my claim. The preferred form of this pen may be seen upon reference to Figs. 1 to 8 of the drawings. In this form the tongues are formed integral with the pen proper. To construct this form of my pen, I stamp from a single piece of gold, steel, or other material the blank shown in Fig. 2. In this blank *aa* are the nibs and *bb* the tongues. This blank is then flat. It is afterward placed between dies of the proper pattern and pressed, bent, or "set up" into the form shown in Fig. 3. It will be seen upon reference to said figure of the drawings that when the pen comes from the dies it is in the shape desired, except that the tongues *b* are left standing upright. (See Fig. 5.) These tongues *b* are afterward bent inwardly and downwardly over the nibs of the pen, their meeting edges

coming together at a^2 , where solder may be applied, if desired, in order to complete the connection. (See Fig. 6.)

It will be seen upon reference to Figs. 1 to 8 of the drawings that the body of the pen is provided with alternate depressions and corrugations, forming in cross-section substantially the shape of the letter **W**. This will be more clearly seen from the cross-sectional view, Fig. 4. This construction provides capillary channels or longitudinal ducts, which extend along each side of the pen from the heel to the shoulder. These ducts are constructed or stamped up as part of the pen from one piece of gold. The tongues $b b$ connect with the front ends of these ducts or channels and serve to provide an overhanging cap, slightly raised above the nib of the pen to allow the free play of the nibs in writing. Between this overhanging cap formed by the tongue, as stated, and the upper surface of the pen the ink is drawn over the nibs from the channels or ducts.

In the drawings, Figs. 1 to 8, three ducts or channels are shown; but I do not wish to be limited to the number employed. The two side ducts, d , which extend along each side of the pen from heel to shoulder, are closed on their under sides and open at the top, while the central duct or channel, e , is open on its under side and closed at the top and extends along the under side of the pen throughout the entire length. This central duct or channel, e , forms a passage for air, that enters under the pen and travels through the duct e up into the ink-reservoir to supply the place of the ink as it is drawn from the reservoir.

The two side ducts or channels d form a passage for ink. The ink is attracted, flows down said ducts or channels, and when it reaches the front termination thereof is attracted and deflected by the tongues b from each side of the pen to the center thereof, where the nibs are located. As before stated, the tongues b practically form a prolongation of the ducts or channels, as they connect with the latter at their front termini and receive the ink therefrom. The ends of the tongues, being bent down laterally over the nibs of the pen, form an overhanging cap elevated above the pen, between which cap and the pen the ink is collected, to be subsequently supplied to the nibs as occasion may require.

Instead of forming the tongues in one piece with the pen, I may form them from a separate piece and affix it to the pen. This modification is illustrated in Figs. 9 to 15 of the drawings. In Fig. 9 is shown the blank from which the pen is formed, the tongues or prolongations of the sides of the pen at the termini of the ducts or channels being omitted. This blank is placed between dies and shaped into the form shown in Fig. 10. In this form of pen the central air-duct, e , and the side ink-ducts d are the same in form and construction and operation, as hereinbefore set forth. Figs. 11 and 12 illustrate the contour

of the pen at the heel and shoulder thereof, respectively. To attract the ink out of the grooves, ducts, or channels, and over the back of the pen, a separate piece, tongue, wire, or other device is shaped so as to lie over the nibs to form a capillary space or chamber to draw the ink out of the ducts or grooves by capillary attraction over the the back of the pen to supply it to the nibs in writing. This separate tongue-piece or cap may be of any desired shape, it being necessary only that it supply the ink to the back of the pen by reason of its being connected with the grooves or ducts at each side. Fig. 13 illustrates in detail the separate lip or tongue b , and Fig. 14 represents the latter applied to the pen in position for operation. It is not material whether the ends of the separate tongue or cap piece b are soldered or fastened upon the outside or inside of the grooves or ducts. Fig. 14 represents the ends of the tongue-piece fastened on the inside. The tongue-piece b is preferably made of thin gold and stamped up to conform to the shape of the back of the pen. When in place it is to stand slightly above the upper surface of the nibs of the pen. It may be of such thin construction that it will bend slightly or give with the pressure of the nibs in writing should the nibs be pressed upon so hard as to push up against the tongue. Instead of making this tongue-piece of sheet-gold, it may be formed, as in Fig. 15, from wire, (preferably gold,) the ends of the wire b being soldered or otherwise fastened to the inside of the grooves or ducts.

In Figs. 16 to 19, inclusive, another modification is shown, in which the longitudinal feeding or capillary groove and its attendant tongue or lip are located on the under surface of the pen. To form this style of pen, a blank similar to that shown in Fig. 9 is employed. The blank is placed in suitable dies. The said edges of the pen-body from heel to shoulder are bent inward to form the side ducts d , the central duct, e , being provided by the intervening space between the inwardly-turned side edges of the pen-body. The tongue-piece, Fig. 19, is made separate from the pen, and lies close up against the under side of the tongue-piece, being fastened or soldered to the pen-body at the front termini of the duct or grooves. The operation of this form of my invention is the same as the others—to wit, the ink being drawn by capillary attraction under the pen.

When the ink is fed to the upper side of the pen, the tongue-piece or lip overlying the pen may stand slightly away from or above the nibs to allow free play thereof, and in addition the tongue or lip may be made so thin as to be slightly flexible, so that should the nibs of the pen strike the lip or tongue-piece it will bend or give slightly. When the tongue or lip is arranged on the under side of the pen, it may be made to lie closer to the pen, for it will not then interfere with the play of the nibs.

The primary object which I aim to accomplish by the present improvements is to provide a pen with such capillary grooves as will of themselves, without the aid of additional parts, devices, or means, draw the ink out of the reservoir or holder upon or under the pen to feed it to the nibs thereof. There may have been indentures, gutters, or grooves formed in pens heretofore, but not for the purpose nor with the effect attained by the above-described arrangement. There may have been pens with slight gutters pressed into the pen, but such gutters did not constitute capillary channels or ducts which of themselves drew or attracted the ink down upon the pen sufficient for writing. Former depressions or ducts in pens may have been made, but always with an overlying plate, or with a rod, spring, or wire lying in or near such ducts to produce sufficient capillary force to draw the ink downward. When pens have been made with a slight depression in the heel or rear end, such depression of itself did not draw the ink down out of the reservoir. Such depression being overlaid with a plate or other device, as stated, it was the capillary attraction produced by the overlying plate or device lying close to or within the depression that drew the ink out upon the pen. Without such tongue or plate the depression in such a pen, as described, could not under any circumstances attract or draw ink from the reservoir, nor are such gutters calculated or intended to do so without some accompanying device in the shape of an overhanging or inlying tongue or plate or wire to produce the requisite capillary surfaces or attraction to draw the ink upon the pen for writing.

In practice the shank of the pen may be made narrow, so as to fit a small orifice in the nozzle, (see Fig. 21;) or the shank may be broadened and made as wide as desired. When the narrow shank is employed, the pen is simply inserted in the plain small smooth orifice through the nozzle, while a broader shank would require that the orifice be worked out specially for it, so as not to be left too large for ink to drop out. To hold a wide shank in place, grooves should be formed in the bottom of the orifice of the nozzle to receive the downwardly-turned side edges of the shank of the pen. This is shown in Fig. 20.

In Figs. 22, 23, and 24 another modification of the pen is shown. In this modification the pen works on the same principle; but it has but a single capillary duct pressed down in the middle of the pen and running longitudinally of the pen from the heel to the nibs. In this form of my invention the overhanging cap or lip or tongue-piece is dispensed with.

This single capillary groove or duct may be slightly enlarged at its lower terminus to form a basin-like enlargement, *g*, which fills by capillary attraction, and thus the nibs on each side of this enlargement are copiously supplied with ink for writing, the ink run-

ning or flowing down to the point of the pen by capillary attraction. The air takes the place of the ink as it is removed from the reservoir or holder. In this form two air-passages, *e*, are provided on each side of the pen, while a single ink groove or duct, *d*, is in the center of the pen. This is just the reverse of the construction shown in Figs. 1 to 8, inclusive. The slits for the nibs of the pen extend up on each side of the enlargement *g*, as seen at *h*, Figs. 22 and 23.

It will be understood that the ink is drawn by capillary attraction from the ink reservoir or holder by the ink-conducting groove or central duct *d*. The ink flows down the groove or duct and collects in the basin-like enlargement *g*, adjacent to the nibs of the pen. The ink collects at the point where it is most needed to supply the nibs of the pen at all times.

Having described my invention, I claim—

1. In a fountain-pen, the pen-body formed with one or more longitudinal capillary grooves or ducts, which extend back to the heel thereof, as set forth.

2. In a fountain-pen, the pen-body formed with one or more longitudinal capillary grooves or ducts, which extend back to the heel thereof, and the tongue-piece or lip at the front terminal of said ducts or grooves, as set forth.

3. In a fountain-pen, the pen-body formed substantially **W**-shaped in cross-section, so as to provide longitudinal capillary grooves or ducts, which extend throughout the length of the pen back to the heel thereof, as set forth.

4. In a fountain-pen, the pen-body formed with longitudinal capillary grooves or ducts *d* for the passage of ink, and the central duct or channel, *e*, forming the air-passage, as set forth.

5. A fountain-pen in which capillary attraction is produced solely by the use of a pen the body of which is formed with one or more capillary grooves or channels or ducts, which extend back to the heel thereof, and a tongue-piece communicating with the ducts to draw the ink therefrom to the nibs of the pen, as set forth.

6. A fountain-pen having its pen-body provided with one or more capillary ducts or channels, which extend back to the heel of the pen and which of themselves attract the ink from the reservoir, as set forth.

7. A fountain-pen having its pen-body provided with one or more capillary ducts or channels, which extend back to the heel of the pen, and a tongue-piece formed integral with the pen-body and communicating with the ducts or channels, as set forth.

8. In a fountain-pen, the pen-body provided with one or more longitudinal capillary ducts or channels, which extend back to the heel of the pen, so that the channels communicate with the interior of the pen reservoir or holder, so as to draw the ink therefrom, and a tongue-piece communicating with the front termini

of the ducts or channels and lying over the back of the pen above the nibs, as set forth.

- 5 9. A fountain-pen body provided with longitudinal capillary ducts or channels, which communicate with the ink-reservoir, so as to attract the ink from the reservoir, and the tongue-piece to draw the ink from the ducts or channels down to the nibs of the pen, as set forth.
- 10 10. In a fountain-pen, the body provided with longitudinal capillary grooves or ducts, which communicate with the ink-reservoir, so as to attract the ink from the reservoir, and the tongue-piece formed integral with the pen-body and lying over the nibs of the pen and communicating with the front termini of the grooves or ducts, as set forth.
- 15 11. In a fountain-pen, the pen-body formed with one or more longitudinal capillary ink-

conducting grooves or ducts and one or more longitudinal ducts or channels for the passage of air. 20

12. A fountain-pen in which capillary attraction is produced solely by the use of a pen the body of which is provided with one or more capillary ink-conducting grooves or ducts or channels extending longitudinally back to the heel of the pen and adapted to attract the ink from the reservoir to the nibs of the pen, as set forth. 25

In testimony that I claim the foregoing as my own I have hereto affix my signature in presence of two witnesses. 30

PAUL E. WIRT.

Witnesses:

GEO. S. ROBBINS,
C. C. PEACOCK.