

(No Model.)

P. E. WIRT.
FOUNTAIN PEN.

No. 311,554.

Patented Feb. 3, 1885.

Fig. 1.



Fig. 2.

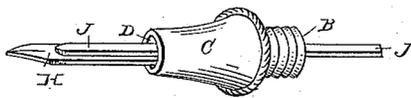


Fig. 3.



Fig. 4.

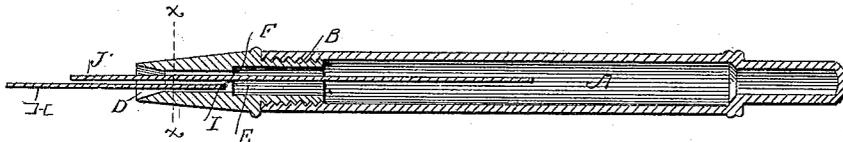


Fig. 5.

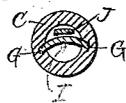


Fig. 6.



Fig. 7.

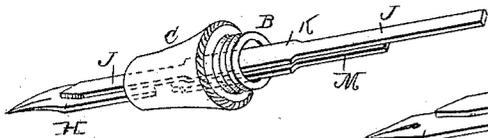


Fig. 8.

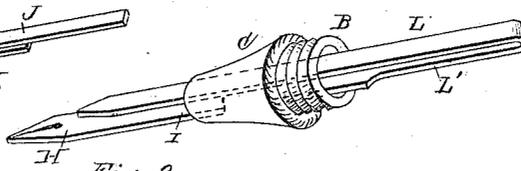


Fig. 9.

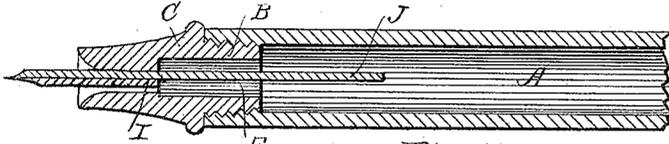
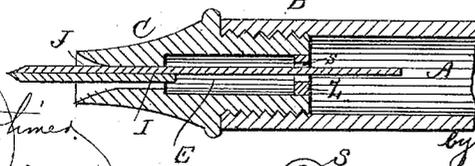


Fig. 10.



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PAUL E. WIRT, OF BLOOMSBURG, PENNSYLVANIA.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 311,554, dated February 3, 1885.

Application filed June 26, 1884. (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, reference being had to the accompanying drawings.

This invention relates to fountain-pens; and it has for its object to provide a device of this character in which the ink will flow freely and steadily by capillary attraction, so as to prevent blots and obviate all danger of the pen "skipping" while in use.

A further object of this invention is to provide a pen of this character which shall combine simplicity, durability, and cheapness in construction with ease, convenience, and efficiency in operation.

With these and other objects in view the said invention consists in providing a rubber shaft securely held or wedged at its widest part within the detachable nozzle of the ink-reservoir, and projecting up within the said reservoir, the lower portion of the shaft resting flat against the body of the pen, and its end lying over the nibs thereof, so as to draw the ink by capillary attraction, and thus supply the pen with a steady and free flow of ink.

The invention further consists in certain details of construction and combination of parts, as hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of my improved fountain-pen with the cap in position to protect the pen. Fig. 2 is a perspective view of the nozzle detached from the ink-reservoir. Fig. 3 is a side view of the pen complete with the cap removed. Fig. 4 is a longitudinal sectional view of Fig. 3. Fig. 5 is a transverse section on the line *x x*, Fig. 4. Fig. 6 is a detail view of the rubber shaft. Figs. 7 and 8 are views illustrating modifications. Fig. 9 is a view of another modification; and Fig. 10 illustrates an improvement which may be used in connection with any of the forms shown.

Like letters refer to corresponding parts in the several figures.

Referring to the drawings, A designates the

handle of the pen, preferably constructed of gutta-percha or other suitable non-corrosive material, and of any desirable form, said handle being hollow so as to form an ink-reservoir, and having its front end internally threaded to receive the threaded extension B of the nozzle C, the latter being adapted to be detached, so as to permit the filling of the reservoir with the necessary supply of ink. The said nozzle is provided with a central perforation, D, at its front end, and extending back so as to communicate with a recess, E, in rear of the perforation, and thus form a passage entirely through the nozzle from end to end, the recess being larger in diameter than the perforation, so that a shoulder, F, is formed at the junction of the recess and perforation, for the purpose hereinafter explained. The side wall of the perforation D is formed with inclined slots G, extending from the front end of the nozzle back nearly to the shoulder F, the pen H having its shank or stem I fitted in the slots, so as to be retained firmly in position.

J designates the rubber shaft, constructed sufficiently thin to be pliable and yield readily under the action of the pen, and provided near its center with an enlargement, K, adapted to abut against the shoulder F, and thus be held in place, the front end of the shaft projecting forward through the nozzle above the body of the pen, its extreme point curved down or inward and resting upon the nibs of the pen, the rear end of the shaft extending through the rear end of the nozzle into the ink-reservoir, so as to communicate with the ink in the same.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the annexed drawings. The reservoir is filled with the necessary amount of ink, the nozzle is attached in position so as to cause the rear end of the rubber shaft to project into the ink-reservoir, and the pen is then in condition for use. The rear end of the shaft operates to attract or draw the ink toward the opening or recess E at lower end of holder, and it also assists globules of air admitted through the perforation D to traverse along its length and find their way more easily up through the ink to

supply the vacuum as the ink is withdrawn from the reservoir. If the upper end of the shaft did not project as it does up within the reservoir, the ink after being removed from immediately about the lower opening would remain suspended within the tube by atmospheric pressure at a point above the opening around the pen, where it would be useless as a flowing supply for the nibs of the pen. The shaft attracts or draws the ink downward, and keeps it suspended immediately at lower opening or recess, E, from which point it is drawn upon the points of the pen by capillary attraction, produced by the lower end lying, as shown, above the pen, to the extremity of the nibs, if desired, said shaft being movable and adapted to project more or less from the holder, as circumstances require. The shaft J thus serves a twofold purpose: first, the upper end within the holder attracts and keeps the ink always suspended about the recess E; secondly, the lower end, lying over the pen in the manner shown, produces a slight space between the pen and the shaft, whereby capillary attraction is created and the ink traverses to the points of the pen. Care should be taken in constructing the portion of the shaft that lies over the pen, for, if it be too large or too long at lower end, the attraction then produced would be too strong for the ink within the holder, so as to be drawn out precipitately and cause blotting. The pen, the shaft, the diametric size of the ink-reservoir, as well as the recess E about the pen, taken in conjunction, must be of a size requisite to always maintain or balance the desired quantity or necessary supply of ink over the points or nibs of the pen by capillary attraction and atmospheric pressure as the pen is used. The ink must close entirely the recess E in nozzle when the pen is in use, while at the same time enough is drawn over the pen by capillary attraction to afford a supply in writing. As the ink is drawn from the points of the pen it necessarily reduces the quantity in the reservoir, so that air may be drawn up through the ink, continually dropping or lowering it to the mouth of the reservoir, this action being assisted by the rear end of the shaft projecting up into the reservoir.

In Figs. 7 and 8 are shown two modified forms of the shaft. Fig. 8 illustrates the shaft doubled upon itself, forming two arms, L L', the lower arm, L', being formed with the enlargement K, the rear end of the shaft with the double arms projecting into the ink-reservoir, the front end lying over the pen in the manner hereinbefore described. This shaft affords greater attraction for the ink at the recess E, and it further affords more pliability in operating the pen, since the length of the spring is extensive, the shaft being held at the point K only.

In Fig. 7 I have shown the shaft consisting of two sections, the upper section, J, being longer and of substantially the same form as the shaft shown in the main figures, while the

lower section, M, is short, and is fitted in the nozzle below the section J. Both sections are formed with the enlargements K, to abut against the shoulders F, and thus they are held in place parallel to each other. This construction of shaft insures more ready accumulation of ink at the lower end of the holder within the recess E. The recess E about the inner end of the pen is concave, or larger immediately about its mouth, so as to allow excessive ink, if any occur, to be retained within the recess by attraction, and not run off the points of the pen.

The advantages of my fountain-pen over the present form are numerous. When the pen is in use, the nibs are pressed upward toward the shaft, so as to lessen the space between the shaft and the pen, and thus the attraction for the ink is kept up to the extreme points of the pen, whereas if the shaft is upon the under face of the pen the nibs are pressed entirely away from the shaft in writing, so that ink would recede from the points, and thus produce skipping in writing.

If desired, a very fine gold pen may be used, thus saving material and work and insuring durability, the pen being specially made and adapted for the holder. The shaft being constructed of hard rubber, and sufficiently thin to be pliable, lies over the pen, a free space being allowed around it, so as to accommodate itself readily to the play of the nibs when the pen is in use. It also conducts the ink, if desired, to the extreme point of the pen, thus insuring immediate flow upon the paper when the pen is in use.

My improved pen is simple in construction, inexpensive to manufacture, and efficient in use, and will prove of great utility for the purposes intended.

In Fig. 9 is shown another modification of the rubber shaft, which consists of a simple square, round, or other suitably-shaped shaft (preferably of hard rubber) and forced through the perforation D of the nozzle above the pen, thereby secured permanently in place along the upper surface of pen and upon the upper inner surface of the nozzle. The pen communicates at its rear end with the ink drawn down into the recess E by the rubber shaft, the latter being securely held in place, its upper end extending into the ink-reservoir, while its lower end lies over the nibs of the pen. Sufficient capillary attraction is produced around and under the shaft to draw ink from recess E down upon the pen. It will be seen that the pen and shaft do not entirely close the opening or perforation D, so that air can escape into the ink-reservoir to fill the vacuum left by the ink as it is drawn down.

The improvement shown in Fig. 10 consists in placing a hard-rubber disk, button, or partition, Z, at the inner end of the recess E, said disk or button being perforated at s to allow the rubber shaft J to project into the ink-reservoir, the outer end of the shaft lying over the pen in the manner hereinbefore described.

The shaft is preferably constructed, arranged, and secured in place as shown in Fig. 9, and the rubber disk or button may be formed integral with the nozzle or in a separate piece therefrom. By this arrangement, if the holder is suddenly placed in an inverted or thrown into a writing position, the ink within the holder or reservoir is moderated in its course to the pen, and cannot so readily or precipitately gain exit and cause blotting.

The rubber shaft shown in Figs. 9 and 10 has no enlargement to hold it in place, and by reason of its attachment it does not require any, since the shaft is held in place by being driven through the space between the upper face of the pen and the adjacent inner face of the nozzle, and is thereby permanently retained from dislodgment.

These and other modifications in the construction of the pen may be resorted to without departing from the spirit or scope of my invention.

I would have it understood that I do not claim a fountain-pen the handle or ink-reservoir of which is provided with a conduit and a metallic plate extending through the latter, the ink passing from the reservoir to the conduit and through its outlet, so that the upward movement of the pen while writing will force the plate upward to pump or urge the ink which clogs in the conduit down upon the back of the pen. The metallic plate is secured at its inner end within the handle or ink-reservoir, and for that reason cannot be used to draw the ink from the reservoir downward to the pen. The conduit receives the supply from the reservoir, and the plate urges it upon the back of the pen. The plate does not draw the ink from the reservoir down upon the pen, and would not act without the conduit. Furthermore, the plate would soon corrode with ink, and by the continuous pumping action will soon become practically worthless. Moreover, the ink clogging in the conduit will fall precipitately while writing upon the paper, producing blots, inasmuch as the vacuum caused by withdrawal of a portion of the supply from the ink-reservoir will not be supplied with the necessary amount of air to fill this vacuum and suspend the ink around the pen.

Having described my invention, I claim—

1. In a fountain-pen, the combination, with the ink reservoir, of the nozzle fitted thereto and carrying the pen, and the rubber shaft extending through the nozzle in the space between the inner face of the latter and the upper face of the pen, and held within the nozzle

at an intermediate point of its length, one end of the shaft extending beyond the nozzle into the ink-reservoir, so as to draw the ink downward from the same, while the other end lies over the pen, so that when the latter is pressed upward in writing it comes in contact with the shaft to produce capillary attraction and cause the feeding of the ink downward upon the pen, as set forth.

2. In a fountain-pen, the combination, with the ink-reservoir, of the nozzle detachably fitted to one end of the same, the pen attached to the nozzle, and the rubber shaft provided with an enlargement to hold it in place in the nozzle, and one end extending into the ink-reservoir, and the other end of the shaft lying over the pen, as set forth.

3. In a fountain-pen, the combination, with the ink-reservoir, of the nozzle detachably fitted to one end of the same, and formed with a recess at its inner end, a pen attached to the nozzle, and having its inner end arranged to communicate with the ink which accumulates in the recess, and a rubber shaft formed with an enlargement fitting within the recess, the rear end of the shaft extending into the ink-reservoir, while the front end lies over the pen, as set forth.

4. In a fountain-pen, the combination, with the handle or ink-reservoir, of the nozzle fitted thereto and carrying the pen, a recess at the inner end of the nozzle, and a rubber shaft held within the nozzle at an intermediate point of its length, one end of the shaft extending beyond the nozzle into the ink-reservoir, so as to draw the ink downward into the recess, while the other end lies over the pen, so that when the latter is pressed upward in writing it comes in contact with the shaft to produce capillary attraction and cause the feeding of the ink from the recess upon the pen, as set forth.

5. In a fountain-pen, the combination, with the ink-reservoir, of the nozzle fitted to one end thereof and carrying the pen, a recess at the inner end of the nozzle, a perforated disk fitted in the inner end of the recess, and a rubber shaft passing through the nozzle and disk, arranged and operating as and for the purpose set forth.

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

PAUL E. WIRT.

Witnesses:

J. K. BITTENBENDER,
C. C. WIRT.