(No Model.)

P. E. WIRT.

FOUNTAIN PEN.

No. 328,169. Patented Oct. 13, 1885.

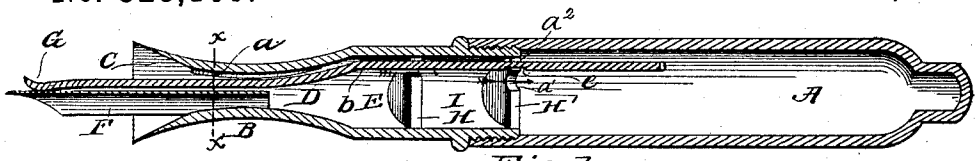


Fig. 1.

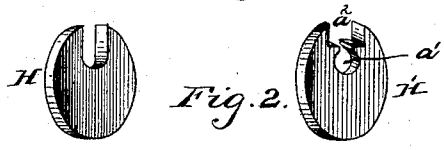
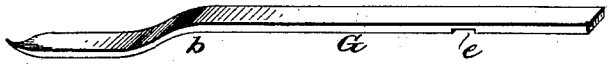


Fig. 2.



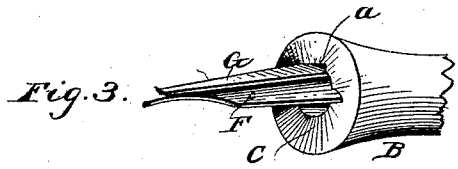


Fig. 3.

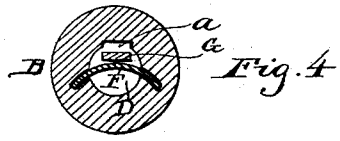


Fig. 4

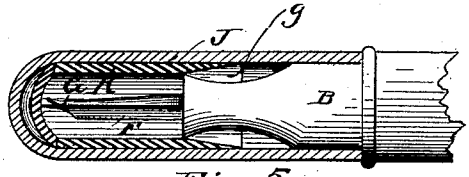


Fig. 5.

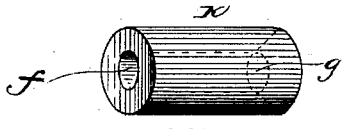


Fig. 6.

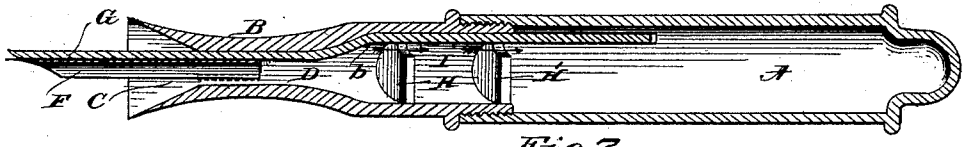


Fig. 7.

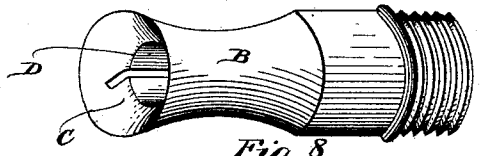


Fig. 8.

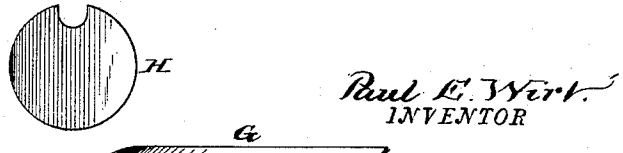


Fig. 9.

WITNESSES

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UNITED STATES PATENT OFFICE.

PAUL E. WIRT, OF BLOOMSBURG, PENNSYLVANIA.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 327,169, dated October 13, 1885.

Application filed December 22, 1884. Serial No. 150,978. (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 improve the construction of the same, so as to make them more reliable in action, the flow of ink being regular and continuous to the extreme points or nibs of the pen, thereby avoiding the common fault of "skipping," and producing an article of this character which will be practicable and efficient for the purposes intended.

A still further object of the invention is to provide an improved cap or cover to fit over the nozzle and pen and protect the latter when not in use.

With these ends in view the said invention 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 longitudinal sectional view of a fountain-pen embodying my improvements. Fig. 2 is a detail perspective view of the rubber shaft with the two partitions or disks. Fig. 3 is an enlarged view of the front end of the nozzle with the pen and shaft fitted thereto. Fig. 4 is a transverse section on the line *x x*, Fig. 1. Fig. 5 is a longitudinal section of the cap or cover, showing it fitted over the front end of the nozzle. Fig. 6 is a detail perspective view of the soft-rubber tube within the cap or cover. Fig. 7 is a longitudinal sectional view of a modified form of pen. Fig. 8 is a detached perspective view of the nozzle. Fig. 9 is a detail view of the shaft and one of the partitions or disks shown in Fig. 7.

Like letters are used to indicate corresponding parts in the several figures.

Referring to the accompanying drawings, A designates the hollow handle forming the reservoir for the ink, and preferably constructed of hard rubber or gutta-percha or other suitable non-corrodible material. One end of this handle is closed, and the other is open and threaded internally around this opening for the reception of the threaded extension provided on one of the ends of the nozzle B, so that the latter may be detached at will when it is desired to refill the reservoir with a supply of ink. This nozzle B is perforated or provided with an opening or passage, D, from end to end, the front portion flaring outward or formed conical to provide an enlarged mouth, C, which will retain superfluous ink from the case or reservoir, and allow the ink to be returned thereto by simply inverting the handle should too much ink accumulate on the pen. The main portion of the passage D and the enlarged mouth C occupy about one half of the length of the nozzle B, the remaining half being enlarged to form a recess or chamber, E, for the accumulation of ink drawn down from the case or reservoir.

The advantage of having the mouth C funnel shaped, as shown, is for the purpose of retaining, as far as possible, a swell or superfluous flow of ink within the nozzle, instead of allowing it to run out on the pen, and from thence onto the paper in the form of blots. A superfluous flow of ink may result from various causes—*i. e.*, by a sudden inversion of the pen to use in writing, when the case is nearly empty, or heat from the hand and fingers may expand air within the case and force out superabundance of ink. My construction, by being shaped as shown, attracts this superfluous ink equally about its walls until the whole mouth C is filled, and not until then will it run out onto the pen and cause blotting. It has been found by practice that the filling of the chamber very rarely occurs, and consequently less blotting is the result attained.

F designates the pen, preferably gold, having its sides at the rear end seated in downwardly-inclined slots or grooves provided in the opposite walls of the perforation or opening D, and adapted to be withdrawn at will for the purpose of renewal.

G designates the rubber conducting shaft, rod, or strip, received in a longitudinal groove, *a*, of corresponding shape, formed in the upper wall of the passage or opening D, which shaft is bent at an intermediate point of its length, as at *b*, in rear of the groove *a*, to conform to the bend of the nozzle. The shaft G lies loosely over the upper face of the pen,

and plays freely within the groove *a*, the rear end extending back, hinged within the nozzle and projecting from the latter within the case or reservoir.

The enlarged chamber or recess E at the inner end of the nozzle is divided off into a supplemental chamber or compartment, I, by the two perforated or notched partitions or disks H H′, formed of hard rubber or other suitable material. The forward disk, H, is tightly wedged within the chamber or recess E of the nozzle, and is cut out at its upper side to allow the passage and introduction of the rubber shaft G. The rear disk or partition, H′ is fitted within the inner end of the nozzle B, and is perforated at *a′* and notched or cut out at a^2, the rear end of the shaft G being notched on its under face at *e* to catch over the bottom wall of the notch a^2 and fit within the same. By this means the shaft will be retained in place within the nozzle and will be allowed to play loosely under the action of the nibs of the pen to work the ink downward by capillary attraction, in the manner well known. In place of this manner of connecting the shaft within the nozzle, I may substitute any other arrangement which could be adopted for the same purpose. I have shown and described the simplest and best mode of carrying this principle into effect; but I do not wish to be limited to the same, as various modifications may be resorted to without departing from the spirit or scope of the invention. The main object is to connect, by hinging or hooking or otherwise, the rubber shaft at any intermediate point of its length, either to the partitions or the nozzle proper, so as to allow the loose playing of both the front and rear ends of the shaft, and causing the feeding of the ink to be regular and continuous.

The cap or cover shown in Figs. 5 and 6 consists of the outer shell or casing, J, closed at one end and open at the other in the usual manner, and a soft-rubber bushing or tube, K, fitted in the forward half of the cylindrical casing J. This tube K (seen in Fig. 6) has a central passage or opening, *f*, the outer end or termination of which is enlarged or formed conical or funnel-shaped, as at *g*, so as to fit over and around the end of the nozzle B, to prevent the ink from being shaken out into the cap or cover.

In order to make the pen work properly and instantly at all times, dampness or moisture must be preserved between the shaft and the pen, and to effect this the pen proper and that part of the shaft lying out over the pen should be kept perfectly inclosed, which I do by the use of the rubber shaft. Liquids flow instantly over moistened surfaces, while dryness retards the flow. It is quite true that by constructing the hard-rubber cap without the vent or air hole in it would effect the same result; but in slipping such a cap over and off it creates compression and suction by the operation, and the tendency is to force the ink out of the cap or eventually smear the nozzle. The air-vent in the present form of caps allows the air to circulate within the same and dry off the points of pen and shaft, thereby retarding the ink from immediately reaching the point of pen, to be ready there the instant it touches the paper. The suction and compression of the atmosphere within the cap with its soft-rubber bushing is reduced to a minimum in its effect, as the ink is cut off close around the lower edge or rim of the nozzle. Thus the bushing facilitates the operation of the pen, maintaining moisture about the latter and the shaft, so that when the cap is removed the ink reaches the points of the pen instantly by capillary attraction. If dry, the pen will not write at the first touch, but must be moistened in water or dipped slightly in ink; but my improvement overcomes this difficulty, as stated.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the annexed drawings. By the action of the nibs of the pen in writing, the front end of the shaft which lies over the upper face of the pen to the extreme points, is caused to be worked slightly in an upward direction, the hinging of the shaft at the rear end and the groove in the nozzle allowing the loose playing of the said shaft. By this action of the latter greater attraction is afforded for the ink, which is caused to be fed downward and keep a sufficient continuous supply (but not too much) upon the back of the pen at all times. As the shaft is constructed of rubber and not of metal, there will be no corroding of its face; and, furthermore, the action of the shaft will not cause the latter to lose its elastic or spring force, such as would result from the use of spring-metal conductors, for although there is but little strain upon the rubber shaft, yet the peculiar or inherent elasticity of the latter is sufficient to overcome still greater strains, and for that reason I have found rubber to be superior to any other material known to the trade.

It will be observed that the shaft is hinged or pivoted or held at an intermediate point of its length, so that the action of the front end will cause a slight vibratory movement to be given to the rear end within the reservoir or handle, and by that means attract the ink downward therefrom into the chamber or compartment I, formed by the two partitions H H′. There the ink remains suspended or held by atmospheric pressure, and as the continued action or working of the pen feeds the ink upon the face thereof, it reduces the quantity, air immediately rushing in through the nozzle and the openings in the partitions H H′, as indicated by the arrows, to supply the vacuum left by the ink withdrawn. Thus it will be kept up as long as desired, the admission of air within the reservoir preventing the ink from dropping precipitately upon the paper, which is one of the objectionable features to be overcome in the present form of fountain-pens.

In Figs. 7, 8, and 9 is illustrated a modified form of the plan shown in the remaining figures. In this arrangement I employ the bell or funnel shaped mouth for the nozzle, hereinbefore described, and also the two partitions, forming the supplemental compartment or chamber I, but I simplify the construction in many respects. The flexible hard-rubber shaft G is rigidly fixed or wedged against the upper internal surface or wall of the opening D and chamber or recess E, and conforms exactly to the shape thereof, the groove *a* being dispensed with. This shaft lies over the extreme point of the pen upon the nibs, and in writing it plays or works with the nibs, the ink being conducted by capillary attraction down along the shaft upon the points of the pen, whence it is drawn upon the paper by the action of the nibs. The extreme tip of this shaft G may be slightly bent upward to avoid getting between the nibs when they are spread apart in writing. The shaft rests close against the surface of the pen, but may be arranged to afford a slight space for the purpose of retaining ink on the upper face of the pen, this construction supplying the ink more readily while in use.

By having this shaft or ink-conductor shaped as shown in Figs. 7, 8, and 9, so as to lie closely along the upper face of the opening in the nozzle, and partly along the upper internal surface of the reservor A, a small interstice, space, or crevice is formed, within and along which the ink is more strongly attracted, and a more reliable flow or supply is drawn continually upon the nibs of the pen than if the shaft were removed to or nearer to the center of the nozzle and reservoir. The partitions H H′ (seen in Figs. 7 and 9) are similarly constructed—that is, are both notched or cut out at the upper edge—to allow the introduction of the shaft, and also permit the passage of air upward into the reservoir, as seen by the arrows, Fig. 7, to fill the vacuum left by the withdrawal of the ink in writing.

The present invention is intended more especially as an improvement on the fountain-pen described and claimed in the application for Letters Patent filed June 26, 1884, and allowed November 28, 1884, Serial No. 136,081, in which the arrangement of the shaft is claimed broadly. Reference is hereby made to this application for a more specific statement of the advantages and operation of this particular feature.

The particular point of merit of the rubber shaft as an ink-conductor is that it supplies ink to the utmost or extreme points of the pen, whereas if it were under the pen it could not go so near to the tip, for it would strike the paper in writing. Having the supply of ink thus always upon the upper face of the pen insures against skipping or imperfect writing, and enables the pen to readily respond to the will of the user to produce fine or shaded lines, as desired.

The hard-rubber partitions H H′, forming the compartment or chamber I, are also a special feature of the invention. The ink accumulates or is drawn down within the chamber, and when the pen is suddenly placed in position when it is desired to write it prevents the ink from rushing down upon the pen too freely, and thereby blotting. It is particularly adapted to retain ink without dropping or blotting when the case or reservoir is nearly empty.

Other advantages are apparent, but it is not necessary to further detail them here, as the simplicity, cheapness, and reliability of the improvement over the existing form of fountain-pens will be seen on comparison.

Having described my invention, I claim—

1. In a fountain-pen, the combination, with the handle or ink-reservoir and the nozzle or pen-section, of the rubber ink-conducting shaft passing through the nozzle and having one end lying over the back or upper face of the pen, and the other end projecting into the ink-reservoir, said shaft being pivoted or hinged at an intermediate point and working loosely within the nozzle, each end of the shaft having a slight movement, for the purpose set forth.

2. In a fountain-pen, the handle or ink-reservoir and the nozzle or pen-section, in combination with the ink-conducting shaft passing through the nozzle and having one end projecting into the ink-reservoir and the other end lying over the back of the pen, said shaft being hinged, pivoted, or held at an intermediate point of its length, and arranged within the nozzle below the top wall thereof, so as to play loosely upward along its entire length, as set forth.

3. In a fountain-pen, the handle or ink-reservoir and the nozzle or pen-section, in combination with the ink-conducting shaft passing through the nozzle and arranged loosely below the inner wall thereof, so as to be capable of a free upward movement, one end of the shaft projecting into the reservoir and the other end lying over the pen, the rear end of the shaft being hinged or pivoted, as set forth.

4. In a fountain-pen, the handle or ink-reservoir and the nozzle or pen-section, the latter being formed with a chamber or compartment at its inner or rear end, in combination with the ink-conducting shaft passing through the nozzle, and hinged, pivoted, or held to one of the partitions of the chamber or compartment, so that the front end of the shaft works upward in writing, and the rear end within the reservoir works slightly downward, as set forth.

5. In a fountain-pen, the handle or ink-reservoir, and the nozzle or pen-section, the latter being formed with a chamber or compartment for the accumulation of ink, in combination with the ink-conducting shaft, arranged loosely within the nozzle, and having one end lying over the pen and the other end projecting into the ink-reservoir, said shaft being hinged, pivoted, or held to the rear partition of the

compartment or chamber, for the purpose set forth.

6. In a fountain-pen, the handle or ink-reservoir, and the nozzle or pen-section, the latter having a chamber or compartment at its inner or rear end for the accumulation of ink drawn down from the reservoir, and an enlarged mouth at its front end, in combination with the ink-conducting shaft passing through the nozzle and its chamber or compartment, and having one end projecting into the ink-reservoir and the other end lying over the back of the pen, arranged and operating, whereby the ink brought down from the reservoir accumulates within the chamber or compartment, from whence it is drawn along the shaft upon the back of the pen, the enlarged mouth of the nozzle serving to retain a superfluous supply of ink, which may be brought down by the shaft, for the purposes set forth.

7. In a fountain-pen, the handle, case, or reservoir, and the nozzle or pen-section fitted thereto, said nozzle having its inner end subdivided to form a chamber or compartment in which the ink accumulates from the reservoir, and the ink-conducting shaft passing through the nozzle, and its chamber or compartment, arranged and operating, whereby the ink within the latter is caused to travel along the shaft upon the pen, and is held from escaping into the space of the nozzle forward of the chamber or compartment, as set forth.

8. In a fountain-pen, the handle, case, or reservoir, and the nozzle fitted thereto and carrying the pen, said nozzle having its inner end in rear of and beyond the pen subdivided to form a chamber or compartment in which the ink accumulates from the reservoir, and is held from escaping into the space within the nozzle forward of the chamber or compartment, in combination with the ink-conducting shaft passing through the nozzle and its chamber, the ink within the latter traveling along the length of the shaft down upon the back of the pen, as set forth.

9. In a fountain-pen, the handle, case, or reservoir, and the nozzle fitted thereto and carrying the pen, the inner end of the nozzle forming a recess or chamber, in combination with disks, buttons, or partitions subdividing this recess into a separate compartment for the accumulation of ink from the reservoir, and the ink-conducting shaft passing through the nozzle and chamber, for the purpose set forth.

10. In a fountain-pen, the handle, case, or reservoir, and the nozzle fitted thereto and carrying the pen, said nozzle having its inner end in rear of and beyond the pen subdivided by a series of perforated or notched buttons, disks, or partitions to form a chamber or compartment in which the ink accumulates from the reservoir, and the ink-conducting shaft passing through the nozzle and the perforations of the partitions, the space within the nozzle forward of the chamber supplying air to the reservoir through the perforations of the partitions, for the purpose set forth.

11. In a fountain-pen, the handle, case, or reservoir, in combination with the nozzle fitted thereto and carrying the pen, and the ink-conducting shaft passing through the nozzle and lying over the back of the pen, the front end of the nozzle flaring outwardly to provide a funnel-shaped mouth to retain a superfluous supply of ink which may be brought down by the shaft, as set forth.

12. The handle, case, or reservoir, in combination with the nozzle, enlarged at its inner end to provide a recess or chamber, curved down to form the main passage in which the pen is seated, and then flaring outward at its forward end to provide an enlarged mouth, which serves to retain a superfluous supply of ink brought down by the shaft, and thus prevent it from dropping precipitately upon the paper in blots, as set forth.

13. In a fountain-pen, the handle, case, or reservoir, and the nozzle fitted thereto and carrying the pen, in combination with the ink-conducting shaft, formed at an intermediate point of its length with a downward bend, *b*, and having one end projecting into the ink-reservoir and the other end lying over the pen, as set forth.

14. In a fountain-pen, the handle, case, or reservoir, and the nozzle fitted thereto and carrying the pen, in combination with the ink-conducting shaft having its rear portion hinged or pivoted to a disk at the rear or inner end of the nozzle, the main portion of the shaft working or playing loosely within a groove in the inner face of the nozzle over the pen, as set forth.

15. The combination, with the nozzle or pen-section of a fountain-pen, of the herein-described cap or cover having a soft-rubber tube or bushing arranged within the same, the outer end of the bushing having an enlarged opening to receive and accommodate the front end of the nozzle, which entirely closes the opening, so as to retain a partial vacuum within the cap or cover, for the purpose set forth.

16. The combination, with a nozzle or pen-section of a fountain-pen, of the herein-described cap or cover having a soft-rubber tube or bushing located within the same, the outer end of the bushing being open to allow the insertion of the front end of the nozzle into the same, said nozzle fitting the tube snugly and serving to close the entrance thereto to prevent the admission or circulation of air around the pen, for the purpose set forth.

17. In a fountain-pen, the combination, with the handle or ink-reservoir, and the nozzle fitted thereto and carrying the pen, of the partitions or disks at the inner end of the nozzle, forming the chamber or compartment for the accumulation of ink from the reservoir, and the ink-conducting shaft pivoted or hinged to

one of the partitions or disks, as and for the purpose set forth.

18. In a fountain-pen, the combination, with the handle or ink-reservoir, and the nozzle fitted thereto and carrying the pen, of the partitions or disks at the inner end of the nozzle forming the chamber or compartment, a notch in one of the partitions, and the ink-conducting shaft having its rear end notched to catch over the bottom wall of the notch in the partition, as 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:
C. C. PEACOCK,
C. C. WIRT.