

No. 675,699.

Patented June 4, 1901.

P. E. WIRT.  
FOUNTAIN PEN.

(Application filed Sept. 1, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

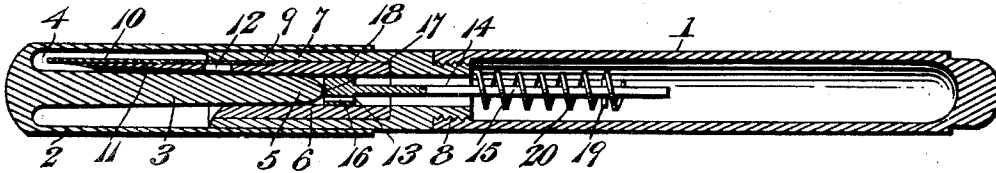


Fig. 2.

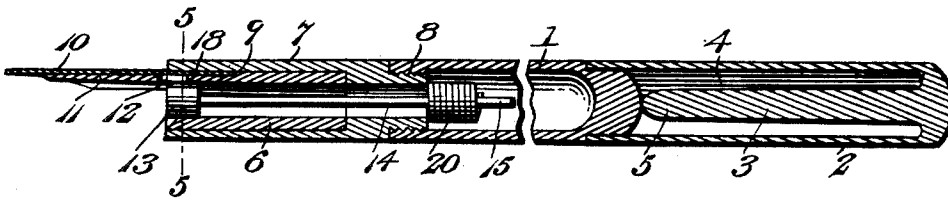


Fig. 3.



Fig. 4.

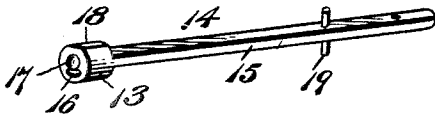
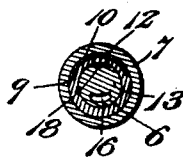


Fig. 5.



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2 Sheets—Sheet 2.

Fig. 6.

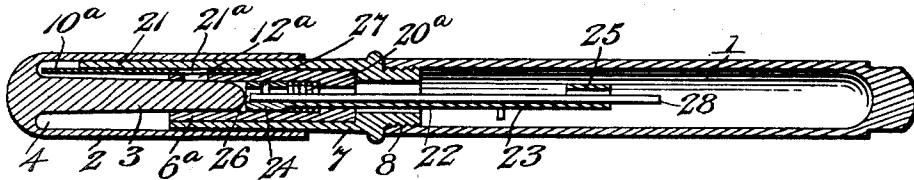


Fig. 7.

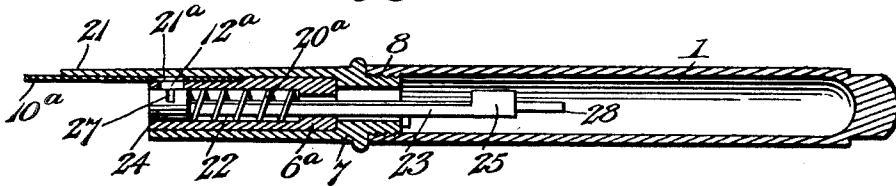


Fig. 8.

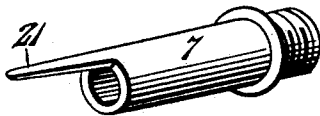


Fig. 9.

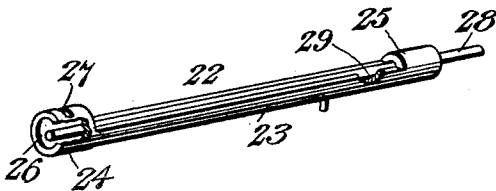
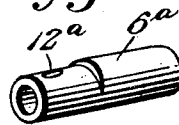


Fig. 10.



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# UNITED STATES PATENT OFFICE.

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## FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 675,699, dated June 4, 1901.

Application filed September 1, 1900. Serial No. 28,788. (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 Fountain-Pen, of which the following is a specification.

This invention relates to fountain-pens principally of the type which provide for feeding ink from the reservoir to the pen-point largely by capillary attraction, and has special reference to certain improvements in the ink-feeding device and pen-cap which provide simple and efficient means for effectively sealing the ink against leakage when the pen-cap is in place and the pen not in use.

To this end the invention primarily contemplates a practical and efficient embodiment of the invention set forth in my companion application of even date herewith, Serial No. 28,787, and has in view the same idea—namely, that of providing cooperating means between the ink-feeding device and the pen-cap, so that when the latter is fitted over the pen the ink will be effectually sealed against flooding to the pen-point or into the cap, thus permitting the pen being carried in any position without possibility of flowing ink into the cap, and thence out upon the fingers or clothing.

With these and such other objects in view, as will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention involving the employment of the movable feeder element adapted to be moved by the cap to an inactive position with reference to the pen-point are necessarily susceptible to modification without departing from the spirit or scope of the invention, and there are shown in the drawings practical forms of construction which may be utilized in carrying out the invention.

In the drawings, Figure 1 is a longitudinal sectional view of a fountain-pen embodying the improvements contemplated by the present invention and showing the pen-cap fitted in position upon the nozzle end of the holder and illustrating the position of the cooperating

ing elements of the ink-feeding device and the pen-cap to cut off the flow of the ink to the pen. Fig. 2 is a similar view of the same construction with the cap removed from over the pen-point and showing the elements of the ink-feeding device in operative relation to provide for flowing the ink to the pen-point. Fig. 3 is a detail in perspective of the form of pen-bearing section constituting a part of the construction shown in Figs. 1 and 2. Fig. 4 is a similar view of the form of plunger-feeder embodied in the construction shown in Figs. 1 and 2. Fig. 5 is a cross-sectional view on the line 5 5 of Fig. 2. Fig. 6 is a longitudinal sectional view of a fountain-pen embodying a modification of the invention in which the pen-point is fed from the top or outer side thereof, showing the pen-cap fitted upon the nozzle. Fig. 7 is a similar view showing the pen-cap removed from the nozzle and the parts of the ink-feeding device in operative relation. Fig. 8 is a detail in perspective of the specially-constructed nozzle embodied in the construction illustrated in Figs. 6 and 7. Fig. 9 is a detail in perspective, partly in section, of the modified form of plunger-feeder utilized in connection with the top-feed pen shown in Figs. 6 and 7. Fig. 10 is a detail in perspective of the tubular pen-bearing section or plug, illustrating a construction thereof well adapted for use in connection with the top-feed pen.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In carrying out the present invention the specially-constructed ink-feeding device and cooperating pen-cap may be associated with the ordinary form of reservoir holder or barrel 1, which provides the main supply-reservoir for the ink, and with said holder or barrel 1 is designed to be associated the pen-cap 2, which in the present invention is provided with an interior cut-off projection 3, which serves the dual function of a stopper or plug for the passage through the nozzle at the lower end of the holder and as an actuator to move the cooperating element of the ink-feeding device to an inactive position. The function of said interior cut-off projection 3 of the pen-cap is therefore substantially the same as the function of the corresponding

element disclosed in my aforesaid companion application, and as in said other application so in the present case the interior cut-off projection 3 is preferably in the form of an elongated post or stem disposed longitudinally and centrally within the cap and projecting inwardly from its closed end toward the open end thereof. The said interior longitudinally-disposed cut-off post or projection 3 is necessarily of a less width than the internal bore or diameter of the pen-cap to provide around the same an intervening annular pen-space 4 to receive the pen-point when the cap is fitted in place. In the present invention the said cut-off projection or post is preferably provided with a tapered tip portion 5, which is designed to have a tight wedging fit within the bore of the pen-bearing section 6, carried by the nozzle 7 at the lower end of the holder or barrel 1, as will be hereinafter more fully pointed out.

In the form of the invention shown in Figs. 1 to 5, inclusive, of the drawings the nozzle 7 is shown as being separate from the holder 25 or barrel and detachably connected therewith; but it will of course be understood that it is within the province of the invention to provide the holder or barrel of the pen with any suitable form of nozzle, whether integral therewith or separate therefrom, as shown in the drawings. The said nozzle 7, as shown in the drawings, is preferably detachably united to the lower end of the holder or barrel through the medium of a screw-joint 8, although any form of joint to effect a detachable connection at this point may be resorted to. The nozzle is counterbored to snugly receive therein the tubular pen-bearing section or plug 6, which in the form of the invention being described constitutes a part of the ink-feeding device for the pen-point. To provide for properly holding the pen-point in position, the tubular pen-bearing section 6 is provided contiguous to the outer end thereof with an exterior channeled pen-seat 9, adapted to tightly receive therein the heel end of the pen-point 10, thus providing means for holding the pen-point in the interval between the tubular pen-bearing section 6 and the inner wall of the tubular nozzle 7, as plainly shown in Figs. 1 and 2 of the drawings and particularly in Fig. 5. The pen-bearing section 6 not only serves as a conduit for the ink from the reservoir, but also acts in the capacity of a feeding element, inasmuch as the said tubular pen-bearing section has extended from the outer end thereof a narrow tapered feeding finger or bar 11, underlying the pen-point 10 and extending well to the tip thereof to provide for attracting or flowing the ink to a position for freely leaving the pen-point. To facilitate the proper attraction or flowing of the ink to the pen-point, the pen-bearing or feeder section 6 is provided therein at the base of its feeding finger or bar 11 with the ink-flowing fissure 12, opening directly at the under side

of the pen-point and designed to be placed in active communication with the interior of the pen-bearing or feeder section through the medium of the movable element or feed-head 70 13 of the longitudinally-movable plunger-feeder 14, extending through the pen-bearing section and nozzle into the main reservoir of the holder. The said longitudinally-movable 75 plunger-feeder essentially comprises a flat shank portion 15, which serves in the capacity of a conductor-shaft to the terminal feed-head 13, provided at the outer end of said shank and slidably registering within the bore or passage-way of the pen-bearing or feeder section 6, thereby constituting, in effect, a plunger head or stopper which serves to hold back the main body of ink and only permits of the flowing thereof under capillary 85 influence to the pen-point. The terminal feed head or stopper 13 of the plunger-feeder is pierced by an air-vent 16, which permits of the necessary ingress of air to replace the ink used by the pen, and the outer side of the said head or stopper 13 may be recessed to form an engaging seat 17 for the tip of the pen-cap projection 3, although this is simply a mechanical expedient that may be used or omitted without in any way affecting the operation of the pen. To render the head or stopper 13 effective as a feeder element for conducting the ink to the ink-flowing fissure 12 adjoining the pen, the said head or stopper 13 fits loosely enough within the bore or passage-way of the pen-bearing or feeder section 6 or is channeled sufficiently upon its exterior surface to provide an annular capillary space 18, which is designed in the normal position of the plunger-feeder to communicate with the ink-flowing fissure 12 by extending partially over said fissure, whereby the film or capillary current of ink is caused to be carried to the pen-point principally by capillary attraction. 110

The flat shank portion 15 of the plunger 14 is provided with a suitable pin or projection 19, adapted to engage with the inner end of the nozzle 7 to limit the outward movement of the plunger-feeder, and said shank of the plunger-feeder also has connected therewith one end of a retractile adjusting-spring 20, the other end of which engages with a fixed point of attachment or bearing, whereby the tension of said spring may be normally exerted in a direction to thrust the plunger-feeder outward, so as to hold the parts of the ink-feeding device normally in operative relation, as shown in Fig. 2 of the drawings. The said retractile adjusting-spring 20 is preferably made of suitable non-corrosive material in order to be unaffected by the fluid within the holder. 120

In the construction described the feeding finger or bar 11 of the pen-bearing or feeder section 6, having the ink-flowing fissure 12, lies substantially against the under side of the pen, and as the pen is of gold and the said finger or bar of rubber the necessary inter- 130

stice is provided between these parts to afford the capillary space for attracting or flowing ink; but it will of course be understood that should it be found necessary to provide a more effective capillary interstice or space between the finger or bar 11 and the pen-point the said finger or bar may be grooved, channeled, or provided with any of the expedients known to fountain-pen manufacturers for flowing ink by capillary attraction. It will therefore be understood that any of these expedients may be resorted to without departing from the spirit or scope of the invention.

With reference to the plunger-feeder, essentially consisting of the shank 15 and the head 13, it will be observed that this device essentially forms a combined feeder and stopper, the same being so constructed that when the cap is not over the pen the head 13 prevents the ink from running precipitately from the holder, besides serving to hold the ink in suspension by capillary attraction and atmospheric pressure. With the parts of the ink-feeding device in their normal positions the head 13 of the plunger-feeder lies within the outer end portion of the pen-bearing or feeder section 6 and projects partly across the ink-flowing fissure 12 to establish and maintain a circulating communication between the said ink-flowing fissure and the annular capillary space 18 about the head 13. Consequently the said head 13 serves to attract and hold suspended at all times while the pen is in use a copious supply or quantity of ink at the lower or outer end of the nozzle, so that it may be readily withdrawn from that point, principally by capillary attraction, and while performing this function the head 13 is so constructed with the vent 16 as to permit the ready ingress of air to the reservoir as the ink is withdrawn in writing. After the pen has been used the cap 2 is placed over the pen-point, thereby carrying the interior cut-off projection or post 3 thereof against the movable feeder element or head 13, and as the cap is moved onto the nozzle or lower end of the holder the plunger-feeder is forced inward against the tension of its adjusting-spring 20, thus carrying the head 13 back within the pen-bearing or feeder section 6 to an inactive position. At the same time the tapered tip portion 5 of the cut-off projection-post or projection 3 closely wedges within the bore or passage-way of the pen-bearing or feeder section, and thus effectually seals the ink from flowing to the pen-point or directly into the cap. Of course upon the removal of the cap the spring 20 readjusts the plunger-feeder to its operative position.

The shape and arrangement of the different parts or elements constituting the present invention may be materially modified without changing the invention or affecting the useful results accomplished, and to illustrate the different embodiments of the invention that may be resorted to there is shown in Figs. 6 to 10, inclusive, of the drawings a

modification in which provision is made for feeding the pen-point from the top or outer side thereof. In this modification the nozzle 7 is constructed, at the outer end thereof, with a tapering feeding finger or bar 21, overlying the pen-point 10<sup>a</sup>, upon the outer or upper side thereof, said pen-point being held within the nozzle by the pen-bearing or feeder section 6<sup>a</sup> in substantially the same manner as already described, inasmuch as there is no material difference between the pen-bearing or feeder section 6<sup>a</sup> and the one embodied in the construction previously described, with the exception that the said pen-bearing or feeder section 6<sup>a</sup> has omitted therefrom the feeding finger or bar. In other respects the pen-bearing or feeder section 6<sup>a</sup> is the same and is even provided with an ink-flowing fissure 12<sup>a</sup> directly adjoining the pen-point and in communication with an ink-circulating port 21<sup>a</sup>, piercing the body portion of the pen-point itself. In connection with this construction there is utilized a longitudinally-movable plunger-feeder 22, provided with a semicylindrical shank portion 23, cut away at one side and having the outer and inner terminal heads 24 and 25, respectively. The outer terminal head 24 constitutes the main plunger or feed-head, which slidably fits within the bore or passage-way of the pen-bearing or feeder section 6<sup>a</sup> and is provided therein with an air-vent 26, thus corresponding in general construction and function to the feed-head 13, forming a part of the construction shown in Figs. 1 to 5, inclusive, of the drawings. In the present modification, however, the terminal feed head or stopper 24 of the plunger-feeder may be provided with an auxiliary ink-flowing fissure 27, which when the plunger-feeder is in its normal position is designed to communicate with the main ink-flowing fissure 12<sup>a</sup> of the pen-bearing section or ink-port 21<sup>a</sup> of the pen-point, as plainly shown in Fig. 7.

In the modified construction being described another feature is emphasized, and that is of arranging the adjusting-spring in a position to suit the particular construction adopted, and while in Fig. 1 of the drawings the adjusting-spring is shown arranged and exposed directly within the reservoir the modified construction provides for housing the said spring directly within the pen-bearing or feeder section 6<sup>a</sup>. In the modified construction the spring is designated by the reference-numeral 20<sup>a</sup> and is illustrated as having one end bearing against an interior shoulder within the pen-bearing section and its other end bearing against the inner side of the outer terminal feed head or stopper 24 of the plunger-feeder. The said plunger-feeder 22 is designed to extend well within the reservoir, and to provide for the better attraction and flowing of the ink there is preferably associated with the plunger-feeder a supplemental feed rod or shaft 28, removably seated within a longitudinal retaining-groove 29, formed in

one side of the shank portion 23 and extended into the opening formed in both heads 24 and 25 of the feeder. The supplemental feed rod or shaft 23 extends well into the air-port 26, 5 piercing the head or stopper 24, and therefore serves to better attract and conduct the ink downward through the nozzle to a point where it may be easily drawn off upon the pen, while 10 at the same time not interfering with the free ingress of air to take the place of the ink withdrawn from the reservoir. When the cap is placed over the pen, the interior projection or post 3 thereof engages with the outer terminal head 24 of the plunger-feeder 15 and moves the same inward out of register with the ink-flowing fissure 12<sup>a</sup> and the port 21<sup>a</sup> of the pen-point, thus providing for sealing the outward flow of ink in substantially the same manner as provided for by the construction previously described. 20

Many other modifications may be resorted to without affecting the principle of construction and operation herein set forth, and it will be understood that various changes in 25 the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what 30 is claimed as new, and desired to be secured by Letters Patent, is—

1. In a fountain-pen, the holder carrying an ink-feeding device having an ink-flowing fissure adjoining the pen-point, and a movable element cooperating with said fissure, 35 and a cap having means for carrying the said movable element to an inactive position.

2. In a fountain-pen, the holder carrying an ink-feeding device having an ink-flowing 40 fissure adjoining the pen-point, and a movable element cooperating therewith, and a cap having means for moving the said element to an inactive position and also for closing the passage-way through the nozzle.

3. In a fountain-pen, the holder carrying a 45 fixed pen-point and an ink-feeding device having an ink-flowing fissure adjoining the pen-point, a movable feeder cooperating with said fissure, and a cap having means for moving said feeder element to an inactive position, and also for completely closing the passage-way through the nozzle. 50

4. In a fountain-pen, the holder carrying a 55 fixed pen-point, and an ink-feeding device having an ink-flowing fissure adjoining the pen-point, and a movable feeder element cooperating with said fissure, and a cap having an interior cut-off projection adapted to fit within and close the passage-way through the 60 nozzle, said cut-off projection being also adapted to engage the movable feeder element and carry the same to an inactive position.

5. In a fountain-pen, the holder carrying a 65 fixed pen-point, and an ink-feeding device having an ink-flowing fissure adjoining the

pen-point and a movable feeder element cooperating with said fissure, and a cap having an interior longitudinally-disposed cut-off 70 post having a wedging fit within the passage-way through the nozzle, and also adapted to engage the movable feeder element to carry the same to an inactive position.

6. In a fountain-pen, the holder carrying a 75 fixed pen-point, and an ink-feeding device having an ink-flowing fissure adjoining the pen-point, and a movable feeder element cooperating with the fissure, said movable feeder element having an air-vent, and an annular capillary surface normally in active relation 80 to said fissure, and a cap having an interior cut-off projection adapted to fit within the passage-way of the nozzle and to engage with said movable feeder element to carry it to an inactive position. 85

7. In a fountain-pen, the holder carrying a 90 fixed pen-point, and an ink-feeding device having an ink-flowing fissure adjoining the pen-point, and a movable feeder element provided with an air-vent and with an annular capillary surface normally held in active relation to said ink-flowing fissure, and means for moving the said feeder element back to an inoperative position, away from the plane 95 of the said ink-flowing fissure.

8. In a fountain-pen, the holder carrying a 100 fixed pen-point, and an ink-feeding device having an ink-flowing fissure adjoining the pen-point, and a normally spring-pressed plunger-feeder having a head provided with an air-vent and an annular capillary surface normally in active relation to the ink-flowing fissure, and a cap having means for moving the said head to an inactive position.

9. In a fountain-pen, the combination with 105 the holder carrying a nozzle, of a tubular pen-bearing section provided with a feeding finger or bar and an ink-flowing fissure opening against the pen-point, a longitudinally-movable plunger-feeder extending through the 110 nozzle and essentially comprising a shank portion and a terminal feed-head at the outer end of said shank portion and provided with an air-vent, and an annular capillary surface normally in active relation to said ink-flowing fissure, an adjusting-spring connected with the plunger-valve for normally thrusting the same to its active position, and a cap having cut-off means arranged to engage said plunger-feeder and move it inward to an 120 inactive position.

10. In a fountain-pen, the holder carrying an ink-feeding device having an ink-flowing fissure directly adjoining the pen-point, and a cap having an interior projection of a length 125 adapting the same to extend into the passage-way of the nozzle past the fissure, whereby said projection will serve to close the said passage-way and also the fissure.

11. In a fountain-pen, the holder carrying 130 an ink-feeding device having an ink-flowing fissure and a movable element cooperating

therewith, and a cap having a projection adapted to engage said element and close the ink-flowing fissure.

5 12. In a fountain-pen, the holder carrying an ink-feeding device having an ink-flowing fissure directly adjoining the pen-point, and a movable element, and a cap having a projection adapted to engage with said element and to extend inside of the passage-way  
10 through the nozzle, said projection being also

arranged to close the fissure when the cap is in place.

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

PAUL E. WIRT.

Witnesses:

C. C. PEACOCK,  
C. W. FUNSTON.