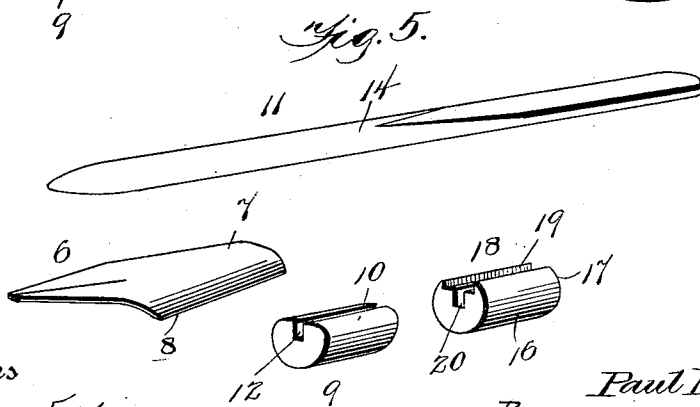
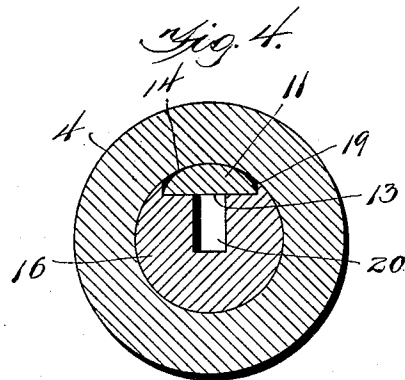
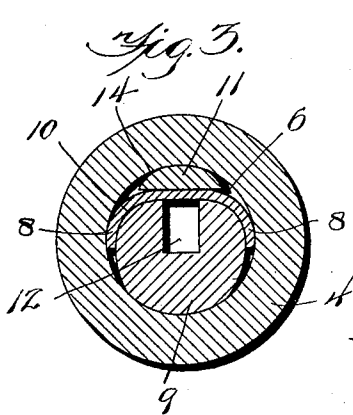
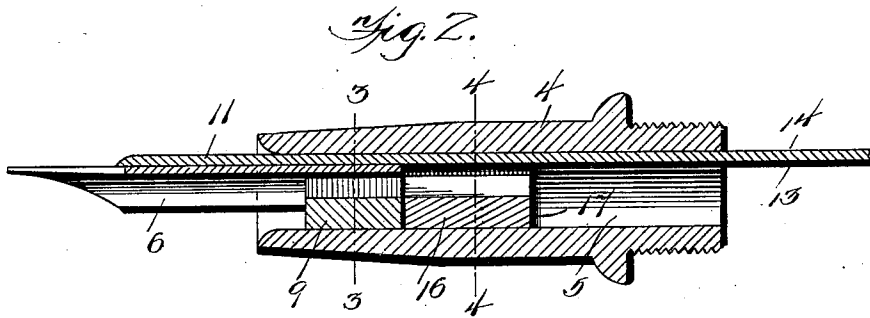


P. E. WIRT.  
FOUNTAIN PEN.

(Application filed Sept. 14, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
*J. L. Noecker*  
*William F. Hall*

Inventor  
*Paul E. Wirt*  
 By  
*S. J. Wolhaupter*  
 Attorney

P. E. WIRT.  
FOUNTAIN PEN.

(Application filed Sept. 14, 1901.)

(No Model.)

Fig. 6.

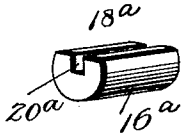


Fig. 7.

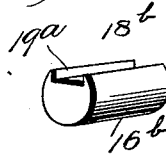


Fig. 8.

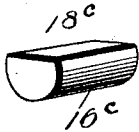


Fig. 9.

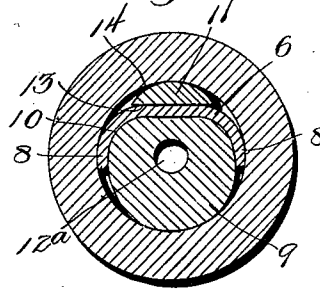


Fig. 10.

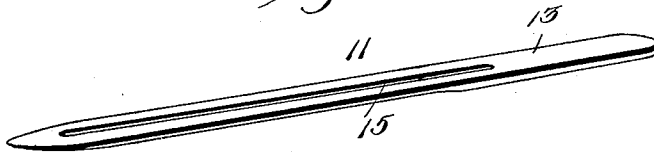
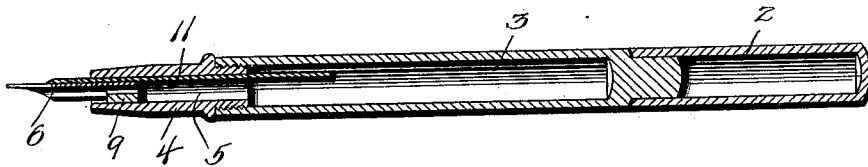


Fig. 11.



Witnesses  
T. L. Kockam  
William F. Hall

Inventor  
Paul E. Wirt  
By S. P. Holchaupter  
Attorney

# UNITED STATES PATENT OFFICE.

PAUL E. WIRT, OF BLOOMSBURG, PENNSYLVANIA.

## FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 706,141, dated August 5, 1902.

Application filed September 14, 1901. Serial No. 75,406. (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 certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

This invention relates especially to fountain-pens of that type in which the flow of ink is controlled principally by capillary attraction; and one of the objects in view is to effect an improvement in the class of fountain-pens known as the "top-feed" pens, whereby provision is made for a better and more reliable feeding of the ink, as well as providing a construction presenting special advantages over fountain-pens employing narrow-heel pen-points, such as embodied in my earlier patent, No. 311,554, dated February 3, 1885.

To this end the invention contemplates a simple and practical fountain-pen construction, not only involving a reliable feeding of the ink to the nibs of the pen-point, but also more economical in point of construction than the old type of top-feed pen, more desirable in appearance and also better affording the use of the ordinary-shaped pen—that is, with the full heel.

Another object of the invention is to associate with the pen novel and improved means for regulating the feed of ink, so as to produce a proper flow thereof. In this connection the improvement possesses special utility in the larger-sized pens requiring larger openings in the nozzle and about the feeder as it lies over the pen and primarily and generically involves the employment of a dam or impulse-check bearing the proper relative relation to the feeder to arrest or modify to a great extent the downward impulse of the ink flow, while at the same time concentrating the downflow of ink on or about the feeder to insure its delivery by capillary attraction to the pen-nibs in such regulated quantities as to entirely obviate skipping or flooding in the writing operation.

With these and many other objects in view, which 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 herein-

after more fully described, illustrated, and claimed.

The essential feature of the invention involved in the construction admitting of the use of a large full-heel pen, and particularly in the employment of a dam or impulse-check, are necessarily susceptible to a variety of modifications; but the simpler and preferred embodiments of the invention are shown in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a fountain-pen constructed in accordance with the present invention. Fig. 2 is an enlarged sectional view of the pen-bearing section and the feeder parts associated therewith. Fig. 3 is a cross-sectional view through the pen-holding plug on the line 3 3 of Fig. 2. Fig. 4 is a similar view through the dam or impulse-check on the line 4 4 of Fig. 2. Fig. 5 is a detail perspective view of the feeder parts or elements, including the dam or impulse-check and showing such parts or elements disassociated. Figs. 6, 7, and 8 are details in perspective, respectively, of different modifications of the dam or impulse-check, showing different ways of providing a circulation area for the ink and ascending air-bubbles. Fig. 9 is a cross-sectional view similar to Fig. 3, showing a modified form of pen-holding plug. Fig. 10 is a detail in perspective, showing a modified form of feeder or feeding-shaft. Fig. 11 is a longitudinal sectional view of a pen, showing how the same may be employed without the dam or impulse-check, especially in the smaller sizes of the pen having contracted passage-ways or bores through the pen-bearing section or nozzle.

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

As already explained, the improvements contemplated by the present invention are largely designed to supersede the construction of the old type of top-feed pen—such, for instance, as disclosed in my former patent aforesaid. This pen, however, has been for many years a standard pen of its kind and has proven thoroughly practical and efficient, although the present invention contemplates obviating the necessity of narrowing the heel of the pen-point and dispensing with the receiving-grooves in the side edges of the pen-

bearing section or nozzle which are engaged by the narrow-heel edges of the pen-point in the old construction and to make it possible to employ the full-heel pen-point, while at the same time insuring a better and more reliable ink flow than has heretofore been possible. In the old top-feed construction referred to the opening or passage-way through the pen-bearing section or nozzle was necessarily contracted in order to obtain a proper flow of ink, and in using a wide or full-heel pen, such as contemplated by the present invention, the conditions are so changed that it is necessary to have a construction embodying parts of such accurate relation and form that the spaces provided both for the ink to descend under, about, and around the feeder and for air to enter and ascend and also to insure the proper capillary attraction are such as to provide the best possible circulation of ink downward to feed the pen properly for writing without flooding or skipping. The construction which is now claimed for accomplishing the above desired object also has a further advantage over the old top-feed pen by providing an easy and more economical way of constructing pens with the top-feed.

The construction which has been adopted for accomplishing the above objects is necessarily susceptible to a variety of structural variations without departing from the spirit or scope of the invention; but the general and important features of the pen are well exemplified by the forms illustrated in the drawings, and referring particularly to these drawings the numeral 1 designates a tubular holder of the ordinary form with which is associated the usual cap 2, designed for housing the pen and feeder parts when not in use and also designed to fit the closed or upper end of the holder during the use of the pen for writing purposes. The holder 1, being of tubular formation, provides the usual interior ink-reservoir 3 of the required capacity for holding a supply of ink, and the said holder carries at the lower or feeding-out end thereof a pen-bearing section or nozzle of some form, which may be either an integral part of the holder or a separate detachable element or nozzle, as shown in the drawings. In the latter the numeral 4 designates the pen-bearing section or nozzle having the usual bore or passage-way 5, which is in direct communication with the interior main reservoir 3 and, in effect, constitutes the lower part of such reservoir.

In carrying out the present invention the bore or passage-way 5 of the pen-bearing section 4 is not provided with pen-holding grooves or the like, but is of such a size as to receive in the outer or lower end thereof the ordinary-shaped pen-point 6, having the full-heel portion 7, designed to register inside of the bore or passage-way 5 and usually formed with well-defined downturned flanges 8, which in the form of pen shown in the drawings largely cooperate with the pen-holding ele-

ment or plug 9 to insure a firm holding of the pen-point in position, while at the same time permitting of the ready assembling or disassembling of the different elements. The pen-holding plug 9 is of an approximately cylindrical form, although sufficiently truncated at one side, as at 10, to compensate for the pen-point curvature and the feeder 11, arranged at the top of the pen-point. Consequently the pen-holding plug 9 fits snugly within the concavity of the heel 7 of the pen-point and bears not only against the top side of the pen-heel, but also against the downward-turned flanges 8, so as to firmly hold such flanges against the sides of the bore or passage-way 5 of the pen-bearing section to produce a sufficiently tight joint to entirely obviate leakage at this point, besides serving to better hold the pen-point in place.

The pen-holding plug 9 essentially consists of a short plug-body of an approximate cylindrical form, as stated; and which is designed to perform several functions: first, as a closure for the lower or outer end of the pen-bearing section and as a holding element for detachably fastening the pen-point itself in position and also as a means for admitting air into the reservoir to relieve the tendency of rarefaction or vacuum caused by the drawing out of the ink to the pen-nibs. To accomplish this last function, the pen-holding plug 9 may be provided with a suitable vent in various ways. For instance, in the principal figures of the drawings the plug-body is illustrated as being provided with an air-vent 12 in the form of a groove or slit in one side thereof, and preferably in the side next to or adjoining the pen-point, this form of air-vent providing simple and practical means for insuring the free admission to cause the proper flow of the ink. Again, in the modification shown in Fig. 9 the air-vent 12<sup>a</sup> is illustrated as consisting simply of a hole or opening bored longitudinally through the body of the plug 9, but necessarily subserving the same function and action as the groove or slit 12 shown in the other figures of the drawings, and it will of course be understood that various other structural variations of this air-vent may be resorted to without affecting the general operation of the pen or the function of the plug 9. The pen-holding plug 9 may also be slightly tapered, should this be found necessary, in order that its wedging fit within the pen-bearing section and against the pen-point may be made very firm, although under ordinary circumstances the tight fit of the parts is sufficient to insure the firm holding thereof in proper operative relation. The said pen-holding plug 9 also cooperates with the top feeder or feeding-shaft 11 to hold the pen-point in place within the pen-bearing section. The feeder 11 consists of a feeding shaft or tongue extending longitudinally through the pen-bearing section or nozzle 4 and having the inner end thereof projecting into the main supply-reservoir 3, while its outer end pro-

jects out of the pen-bearing section and extends over the top of the pen-point to the nibs of the latter. This feeder or feeding-shaft 11 may be of any of the usual forms provided for feeding pen-points at the top side; but a preferable construction is shown in the drawings and resides in constructing the feeding shaft or tongue with a flat under capillary surface 13, designed to lie upon the pen-point, and with an outer convex upper surface 14, which conforms to the inner peripheral contour of the bore or passage-way of the pen-bearing section, and thus insures a more perfect feeding of the parts. The flat under capillary surface 13 of the feeding shaft or tongue may be plain throughout, as shown in some of the figures of the drawings, or provided therein with a longitudinal groove or fissure 15, as suggested in Fig. 10 of the drawings, and extending substantially the full length thereof to assist in the free flowing of the ink by capillary attraction to the pen-nibs. Other variations may be resorted to in the construction of feeding shaft or tongue 11; but in all forms of the invention it will be seen that the full-heel pen-point is held fast in an interposed position between the pen-holding plug and the clamping-feeder, besides having its downturned flanges 8 held firmly against the side walls of the pen-bearing section.

One of the important features of the invention resides in utilizing with the pen, especially in the larger-sized pens requiring the larger openings in the nozzle and about the feeder as it lies over the pen, an auxiliary or supplemental device serving primarily the function of an impulse-check for the ink within the reservoir. Many forms of the device may be employed for this purpose; but a practical construction is shown in the drawings and consists in the employment of an impulse check or dam 16, which is usually in the form of a supplemental plug of an approximately cylindrical form and snugly fitting in the pen-bearing section above the main pen-holding plug and usually in close proximity thereto, while at the same time maintaining such a relation as not to interfere with the free ingress of air through the air-vent. The plug-body constituting the dam or ink-impulse check 16 has the major portion thereof imperforate to present an obstructing-wall or dam 17 to the ink at the bottom of the reservoir, thus providing means for obstructing the flow of ink sufficiently whereby the impulse or flow of the ink may be modified to such an extent as to better regulate the flow thereof. In addition to presenting an obstructing-wall or dam 17 the impulse check or dam body 16 is necessarily provided upon or in the same with an extended capillary circulation area 18 of such an extent and form as to provide sufficient space or room about the feeder as it lies thereover to permit of the circulation of ink downward and the ingress of the air upward. The

extent of this space must be very accurate to insure the proper regulation and flowing of the ink, and, besides, to render the impulse dam or check thoroughly effective the plane of the circulation area 18 must be intersected by the feeder or feeding-shaft.

It is obvious that the circulation area 18 of the impulse check or dam may be provided in many ways. A thoroughly practical and efficient construction, however, is shown in the preferred forms of the invention, and the so-termed "circulation area" 18 in the said construction is formed by providing the dam-body 16 next to the feeder with a longitudinally-channeled seat 19, receiving directly therein the feeding tongue or shaft 11, and in the bases of such seat is formed an open longitudinal fissure or groove 20, which, in connection with the seat 19, insures a proper circulation of ink in and about the feeder and the free ingress of air into the reservoir above the dam. Besides, this construction serves to maintain the feeder and the dam-body in proper operative relation under all conditions; but the proper functions of the elements may be carried out in connection with modifications of the circulation area—such, for instance, as indicated by 18<sup>a</sup>, 18<sup>b</sup>, and 18<sup>c</sup>, respectively, in Figs. 6, 7, and 8. In Fig. 6 the dam-body 16<sup>a</sup> is shown cut away at the side next to the feeder and provided therein with a longitudinal fissure or groove 20<sup>a</sup>, while in Fig. 7 the dam-body 16<sup>b</sup> is illustrated as provided with a plain channeled seat 19<sup>a</sup> for the feeder running lengthwise of the dam-body, and in Fig. 8 the dam-body 16<sup>c</sup> is illustrated as having a plain ungrooved cut-away portion designed to lie next to the feeder. In all forms, however, the impulse check or dam subserves the same function—that is, to modify the impulse or flow of ink to such an extent as to properly regulate the same, besides concentrating the downflow of ink on or about the feeder to insure a proper supply to the pen-nibs, as well as permitting the air to freely enter the reservoir. Furthermore, the impulse check or dam may be utilized in different forms of pens and in combinations other than shown in the drawings without materially affecting the very useful functions thereof.

From the illustration in Fig. 11 it is clear that on account of the simple and practical way in which the several parts of the pen are associated the type of pen described may be utilized with or without the dam. This is principally regulated according to the size of the pen, as the impulse check or dam possesses special utility in the larger-sized pens.

From the foregoing it is thought that the construction, action, and many advantages of the herein-described fountain-pen will be readily apparent to those skilled in the art without further description, and it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from

the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fountain-pen, the holder carrying the pen-bearing section, a full-heeled pen-point fitting within said section and having the edge flanges, a separate detachable top feeder arranged within the pen-bearing section and extending over the top side of the pen-point, and an approximately cylindrical vented plug having a close fit within the pen-bearing section and also tightly registering within the concavity of the pen-point heel and against the edge flanges thereof, said plug and separate top feeder constituting clamping members for holding the pen-point therebetween.
2. In a fountain-pen, the reservoir-holder carrying the pen-point, the feeder, and an interior dam having a body constructed to provide an impulse-check at the bottom of the reservoir, and also to provide an area extending along the feeder contiguous to the pen-point for the circulation of ink downward and air upward.
3. In a fountain-pen, the reservoir-holder carrying the pen-point, a feeding-shaft, and an interior dam having a body constructed to provide an impulse-check at the bottom of the reservoir, and also to provide an area extending along the feeding-shaft contiguous to the pen-point for the circulation of ink downward and air upward.
4. In a fountain-pen, the holder carrying the pen-point, a feeding-shaft, and an interior dam having a body constructed to provide an impulse-check at the bottom of the reservoir, said body also being constructed to permit the circulation of air upward and to concentrate the flow of ink along the portion of the feeder contiguous to the heel of the pen-point.
5. In a fountain-pen, the reservoir-holder carrying the pen-point, the feeding-shaft, and

an interior dam comprising a plug-body constructed to provide an impulse-check at the bottom of the reservoir and having in its side next to the feeding-shaft an extended seat receiving the shaft and forming an extended circulation area along the shaft contiguous to the heel of the pen-point.

6. In a fountain-pen the reservoir-holder carrying the pen-point, the feeding-shaft, and an interior dam comprising a plug-body constructed to provide an impulse-check at the bottom of the reservoir and provided at the side next to the feeding-shaft with a channeled seat receiving the latter and also with a fissure or groove in the base of said seat, the latter constituting an extended circulation area along the inner portion of the shaft contiguous to the heel of the pen-point.

7. In a fountain-pen the reservoir-holder carrying the pen-point, a pen-holding plug bearing against the pen-point, a feeding-shaft overlying the pen-point, and a supplemental vented plug arranged in the pen-bearing section and directly adjoining the pen-holding plug, said supplemental plug being constructed to provide an impulse-check at the bottom of the reservoir, and also to provide an area extending along the shaft for the circulation of ink downward.

8. In a fountain-pen, the reservoir-holder carrying the pen-bearing section, a pen-point, a vented plug fitting within the pen-bearing section and bearing against the pen-point, a feeding shaft or tongue overlying the pen-point and extending through the pen-bearing section, and an impulse check or dam consisting of a supplemental plug arranged in the pen-bearing section above the pen-holding plug and having a circulation area lying next to the feeding shaft or tongue.

In testimony whereof I affix my signature in presence of two witnesses.

PAUL E. WIRT.

Witnesses:

C. W. FUNSTON,  
R. L. ORANGE.