

No. 724,984.

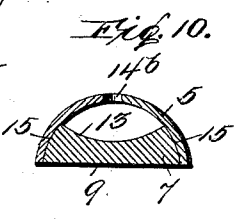
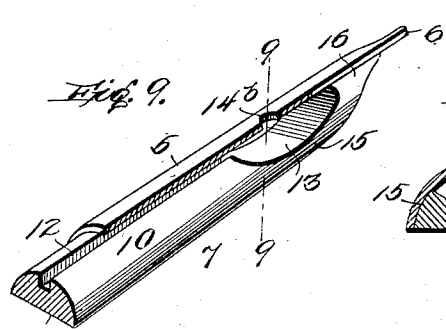
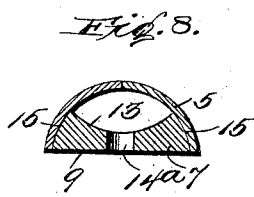
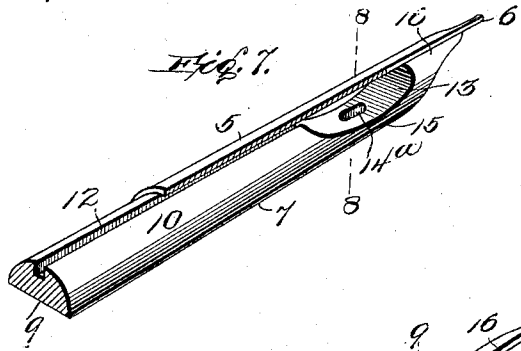
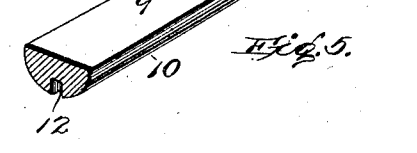
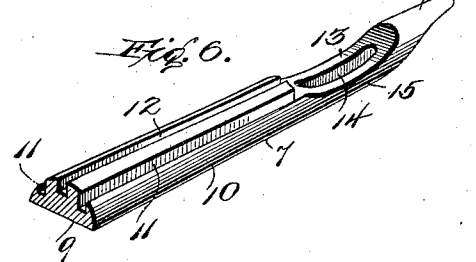
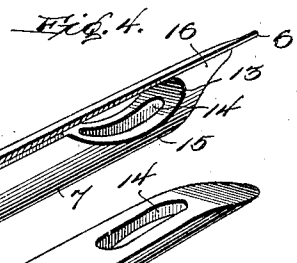
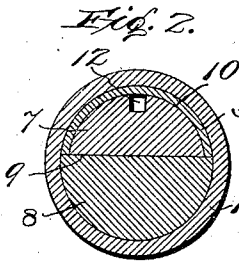
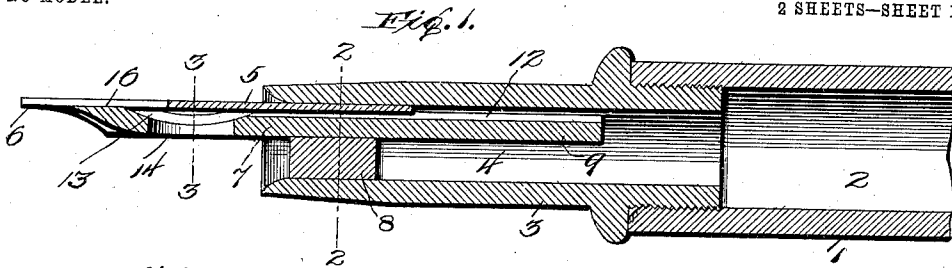
PATENTED APR. 7, 1903.

P. E. WIRT.
FOUNTAIN PEN.

APPLICATION FILED JAN. 12, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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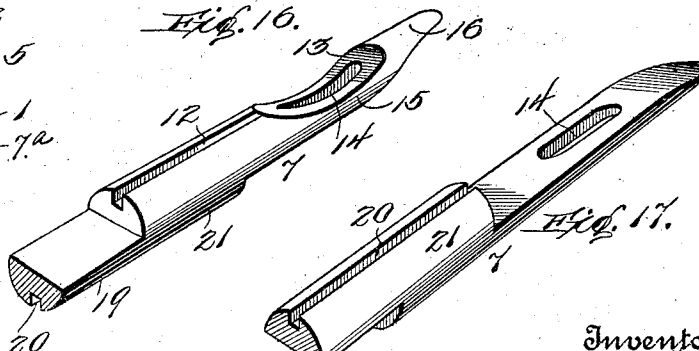
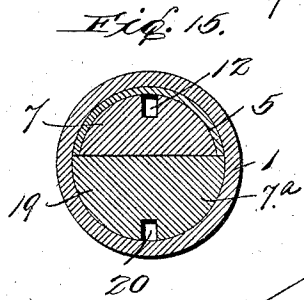
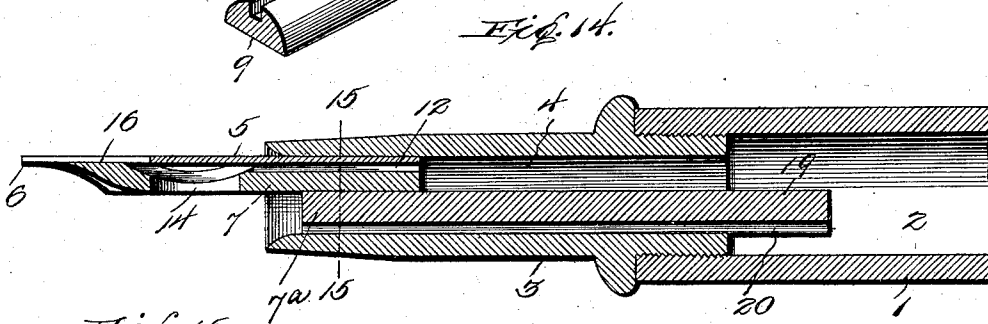
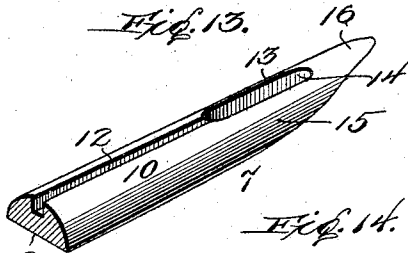
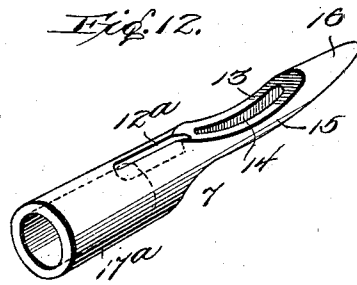
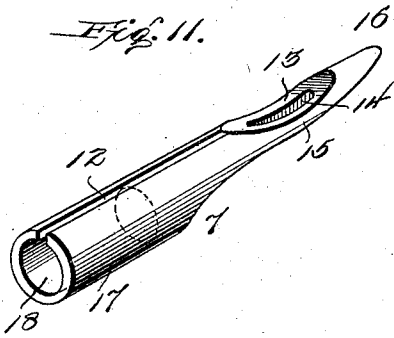
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NO MODEL.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 724,984, dated April 7, 1903.

Application filed January 12, 1903. Serial No. 138,726. (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 to fountain-pens, and has special reference to an improvement in the feeding means thereof to provide for supplying the nibs of the pen-point with sufficient ink for writing purposes by a reliable and not overabundant flow, whereby flooding or skipping may be obviated.

A special object of the invention is to provide an improved type of feeder, so constructed as to prevent the ink from being attracted too strongly at the nibs—that is, immediately under the main surfaces of the nibs—while an ample supply for writing is provided for the point. In this connection the invention has in view a formation of feeder wherein the film of ink-supply lying at the under side of the nibs is divided, separated, or compelled to hang in suspense in the form of a loop or ring across the outer portion of the nibs, thereby assuring an even regular flow, besides preventing skipping and providing in the best way against overattraction, with the consequence of overloading the nibs and causing blotting.

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, which will be hereinafter more fully described, illustrated, and claimed.

The essential feature of the invention involved in the provision of means for dividing or separating the film of ink into an ink loop or ring beneath the nibs of the pen-point is susceptible to a variety of modifications, but preferred embodiments are shown in the accompanying drawings in which—

Figure 1 is a sectional view of the feeding end of a fountain-pen equipped with the improved feeding means contemplated by the present invention. Fig. 2 is a cross-sectional view on the line 2 2 of Fig. 1. Fig. 3 is a similar view on the line 3 3 of Fig. 1. Fig. 4 is a sectional perspective view showing the

preferred form of feeder applied to a pen-point. Fig. 5 is an inverted perspective view of the form of feeder shown in Figs. 1, 2, 3, 55 and 4 of the drawings. Fig. 6 is a perspective end view of a form of feeder involving modified means for supplementing the flow of ink. Fig. 7 is a detail sectional view of a modified form of the feeder applied to a pen-point. Fig. 8 is a cross-sectional view on the line 8 8 of Fig. 7. Figs. 9 and 10 are views similar to 7 and 8, showing another modification in the feeder. Figs. 11 and 12 are perspective sectional views of other modifications involving means for providing a greater body of ink-supply well down within the feeder itself in conjunction with the improved means for providing the ink loop or ring beneath and across the nibs. Fig. 13 is a perspective view of a feeder embodying the simplest provision of means for producing a non-attracting basin beneath the nibs, which basin is surrounded or bounded by capillary attracting surfaces or edges, producing the ink loop or ring film. Fig. 14 is a sectional view of the feeding end or nozzle of a fountain-pen equipped with a modified form of the feeder to assist in attracting and draining the ink back into the reservoir when the pen is inverted after using. Fig. 15 is a cross-sectional view on the line 15 15 of Fig. 14. Figs. 16 and 17 are top and inverted perspective views, respectively, of the type of modified feeder suggested in Fig. 14.

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

All varieties of this invention are applicable to all types of underfeed fountain-pens. Also the special improvements contemplated may be employed in various ways to provide for withdrawing the ink from the reservoir to a point where the improved feeding means so distribute the ink-supply to the nibs as to secure the results aimed for. However, the preferred manner of carrying out the invention is suggested in the accompanying drawings, to which particular reference will be made.

No changes are involved in the general features of the fountain-pen. So in the drawings the numeral 1 designates the tubular holder, providing the main reservoir 2 and carrying

at its lower or feeding-out end the pen-bearing section or nozzle 3 of a permanent or detachable type and having the usual bore or passage-way 4. The pen-bearing section or nozzle receives in the outer lower end thereof the pen-point 5, having the usual nib portions 6 and designed to be detachably held in position by any suitable holding or fastening means, although in some of the principal forms of the invention the pen-point is held in place, in conjunction with the feeder 7 itself, through the medium of a holding-plug 8 of segmental or semicylindrical form and interposed between the inner wall of the pen-bearing section and the outer side of the feeder 7. A single holding-plug may therefore be employed for retaining the pen-point in place, besides locking the feeder in operative relation to such point.

The essential and important feature of the present invention resides in the formation of the feeder 7 itself and its relation to the nibs of the pen-point. This feeder is of simple formation and readily separable from and fitted to the pen-point. It preferably consists of a feed bar or shaft of a comparatively short length and which in some forms does not extend outside of the plane of the pen-point, although in other forms it may be desirable to have it of sufficient length to extend some distance into the passage-way of the pen-bearing section or nozzle. In all forms, however, the same distinctive feature is preserved—namely, that of the provision of means, in or upon the feeder, whereby the film of ink lying against the pen-point adjacent to the nibs is divided or separated to produce an ink loop or ring held in suspense across the outer portion of the nibs.

The above result is accomplished by constructing the feeder with peculiarly and effectively related attracting and non-attracting portions. The attracting or attractive surfaces for drawing the ink to a point where it is taken up by the nibs is usually provided for by the form of the feed-bar and its relation to the under surface of the pen-point, within the concavity of the latter, as plainly shown in Figs. 1, 2, and 3 of the drawings.

In the preferable construction the bar or shaft constituting the feeder 7 is in approximately half-round form, with a flat under side 9 and a convexed upper side 10, whereby the feeder as an entirety may be arranged to fit within the concavity of the pen-point with its top, lateral, and outer terminal surfaces or edges in continuous contact with the said point to produce capillary attracting-channels along the line of such contact. In practice it is almost impossible to locate the feeder so close to the pen-point in the way that it is usually done, so that there will be no capillary space between the pen and the feeder, and particularly if the contacting surface of the feeder is made slightly rough the ink in sufficient quantity for writing will find its way through to the pen between

the closely adjoining or contacting surfaces. The convexed upper side 10 of the feed-bar is preferably held substantially flush within the concavity of the pen-point, as plainly shown in Figs. 2 and 3 of the drawings, and thus provides between itself and the pen, as explained, a continuous line of capillary attracting-surfaces, which necessarily provide for a feeding down of the ink. However, if found desirable to more positively insure passage for the ink downward supplemental ink-feeding fissures or channels 11 may be formed longitudinally in the upper side of the feed-bar and arranged to provide freer communication between the reservoir and the point of supply where the ink is drawn upon the nibs for writing. (See Fig. 6.) Also in order to assist in the proper venting of air into the reservoir to replace the withdrawn ink the preferred form or forms of the feed-bar are constructed in their uppersides with a longitudinally-arranged groove 12, constituting a duct through which air ascends into the reservoir and along the edges of which duct ink will also be drawn by capillary attraction when the pen is in use.

In the preferred form of the invention shown in Figs. 1 to 5, inclusive, the edges and corners of the circulating-duct 12 in conjunction with the capillary attracting-spaces between the contacting surfaces of the feed-bar and the pen-point will ordinarily be sufficient to provide a proper supply of ink for writing purposes, although the supplemental fissures or channels 11 may be resorted to if found necessary or desirable.

Referring more particularly to the provision of means for dividing or separating the film of ink under the nibs of the pen-point, it is to be noted that in all forms of the invention this is secured by providing the feed-bar in the outer end portion thereof with what may be characterized as a non-attracting basin 13. In its simplest aspect this basin 13 at the upper side of the feed-bar under the nibs of the pen may be formed by a properly-arranged elongated hole or slot 14, as shown in Fig. 13 of the drawings, which hole or slot not only provides the basin, space, or cavity itself to divide or separate the film of ink at this point, but also forms an air-vent through which air enters and thence ascends the circulating-duct 12 into the reservoir. In the preferred forms of the invention the non-attracting basin 13 is formed by a prolate cavity dished out from the upper side of the outer end portion of the feed-bar, and which therefore provides a somewhat-enlarged and very well defined space, chamber, or basin beneath the nibs of the pen-point and which has no attractive influence on the ink, and hence serves to divide or separate the film as it is drawn downward along the capillary surfaces above the basin. In the preferable form of the invention (shown in Figs. 1 to 4 of the drawings) the opening 14 is a separate and distinct part of the construc-

tion, though opening directly through the basin in the same sense and relation as suggested in Fig. 13 of the drawings.

To provide a most effective construction, the outer end portion of the feed-bar, provided with the basin referred to, may be swelled laterally; but in all forms and irrespective of how the basin, cavity, or loop is provided the same serves to divide the film of ink and causes it to separate into lateral streams along the lateral attractive feeding-surfaces 15, which constitute narrowed continuations of the convexed surface of the feed-bar, which are in contact with the side portions of the pen-point and which are continued directly into the terminal distributing-foot 16 at the lower extremity of the bar and of rounded form so as to fit closely under the nibs and extend transversely across the same, so that there is no interruption in the flow of ink along the surfaces 15 and onto the somewhat-elongated surface of the distributing-foot 16, which provides for connecting the two streams, and thus maintaining an ink loop or ring about the basin 13 and beneath the nibs of the pen-point.

As suggested in Fig. 7 of the drawings, a comparatively small air vent or hole 14^a may pierce the feed-bar in the plane of the non-attracting basin 13, while in Figs. 9 and 10 of the drawings is suggested the modification of providing the feed-bar with a plain dished-out basin and in locating the air-vent 14^b in the pen-point itself, but within the plane of the basin, so that the air may readily enter into the space provided by the basin and thence into the circulating-duct 12.

It may be desirable to maintain a greater body of ink-supply well down within the feeder itself, and this may be accomplished by a modified form of feeder, such as shown in Fig. 11, in which the feed-bar is provided at its inner end with a cylindrical plug portion 17, which dispenses with the use of a separate holding-plug, and of a hollow formation to provide therein a supplemental supply-chamber 18, from which the ink passes downward through the contacting surfaces between the pen and feeder and along the edges of the circulating-duct 12, through which open duct air also ascends upward into the reservoir.

Another modified form of feeder similar to the one shown in Fig. 11 is illustrated in Fig. 12. In this modification a greater dishing out of the feed-bar occurs at the point where the basin is provided, and instead of a continuous open longitudinal duct a short circulating-opening 12^a pierces the hollow plug portion 17^a, through which opening the ink is attracted by reason of the adjacent contacting edges of the pen, while the air to take the place of withdrawn ink also enters through such opening and ascends out of the hollow plug portion into the reservoir.

Another improvement constituting a part of the invention is shown in Figs. 14 to 17, in-

clusive. This improvement consists in arranging at one end of the feed-bar, especially when the latter is of the short length shown in the several figures of the drawings, an inner feeding-shaft extension 19. This inner shaft extension 19 is preferably disposed below the plane of the feeder or feed-bar 7 and is of a sufficient length to project well up into the reservoir to provide an auxiliary feeding element, which serves principally for draining back superfluous ink into the reservoir after using the pen and the same is inverted. The relative length of the feeder and the member 19 may obviously be varied to meet any required conditions without affecting the utility of the combination. The member 19 is provided in one side with an open longitudinal duct 20, which communicates directly with the reservoir and also with the mouth of the pen-bearing section or nozzle. The inner shaft extension 19 may constitute an integral part of the holding-plug 7^a for securing the pen-point and feeder in place, as suggested in Fig. 14 of the drawings, although, as illustrated in Figs. 16 and 17 of the drawings, the said feeding-shaft 19 extension may be projected integrally and rearwardly from an integral plug portion 21, provided at the inner end of the feeder itself. In either aspect, however, the inner shaft extension 19 preferably lies along the side of the pen-bearing section opposite the plane of the pen-point. In this connection it will also be observed that the member 19 in all cases constitutes a vented holding-plug member for retaining the feeder and pen-point in operative relation, and the special utility of the duct 20 in the said member resides in making provision for a separate and adequate air-admission channel or opening. This function of the duct 20 is necessarily preserved irrespective of the length of the member 19, and on account of this adequate air-vent for the pen there is always a sufficient fissure, no matter how protracted, between the pen and the contacting feeder to supply sufficient ink to the nibs for good writing.

The provision of the inner shaft extension 19 is intended to drain back into the reservoir or case the superfluous ink about the pen and feeder that might have accumulated in sufficient quantity while using the pen, so that when the pen is inverted and returned to the pocket such ink would well out over the edges of the nozzle about the inner surface of the cap, and thereby soil the fingers. This is obviated by the construction described, although said arrangement does not dry off entirely adjacent capillary surfaces—only superfluous or unnecessary ink.

In further reference to the non-attractive basin 13 involved in all forms of the invention it should be noted that in the preferred form of feeder (shown in Figs. 1, 2, and 4) the cavity forming the basin has the surfaces thereof cut away materially around the edges of the air vent or opening 14 to form such a space under the nibs that when a swell of ink

comes there is an accommodating or receiving space provided therefor between the pen and the feeder, within which space the superfluous ink may be retained, so as not to drop off and blot. However, this is an added function to the construction described and is aside from the other function indicated—namely, that to widely separate the attractive surfaces adjacent to the nibs and to join the separated streams or films across the surface of the distributing-foot 16.

From the foregoing it is thought that the construction, use, and many advantages of the herein-described improvement in fountain-pens will be readily apparent without further description, and it will be noted that other changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

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

1. In a fountain-pen, the combination with the holder carrying the pen-point, of a feeder having attractive surfaces at the outer end portion arranged to separate the stream and hold a loop of ink in suspense across the nibs.

2. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen in continuous contact therewith and having means for separating the film or stream of ink beneath the nibs.

3. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen and in continuous contact therewith and having means for separating the film or stream adjacent to the nibs, and for joining the separated streams transversely across and beneath the nibs.

4. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen in continuous contact therewith and having means for holding a loop of fluid in suspense transversely across and beneath the nibs.

5. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen and having, contiguous to the nibs, a non-attracting space bounded by capillary attracting-surfaces.

6. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen and provided, contiguous to the nibs, with a non-attracting basin bounded by capillary attracting-surfaces arranged to hold a loop of fluid in suspense across the nibs.

7. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen and provided in its upper side, contiguous to the nibs, with a non-attracting basin bounded by

capillary attracting-surfaces arranged to carry the separated streams to the point of merger upon the outer terminal of the bar.

8. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen with its top, lateral, and outer terminal surfaces in continuous contact therewith to provide capillary attractive channels along the line of such contact, said feed-bar being provided in its upper side, contiguous to the nibs, with a cavity producing a non-attracting basin bounded by capillary attracting-surfaces.

9. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar having a convexed side lying within the concavity of and in contact with the pen and provided in such side, contiguous to the nibs, with a prolate cavity producing a non-attracting basin, said bar being further provided at its outer extremity with a terminal distributing-foot having a contact with the pen transversely of the nibs, and narrowed lateral attracting-surfaces at the sides of the basin and continued into the surface of said foot.

10. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen and provided, contiguous to the nibs, with a non-attracting basin bounded by capillary attracting-surfaces, and means for venting air to the reservoir through said basin.

11. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen and provided in its upper side, contiguous to the nibs, with a non-attracting basin bounded by capillary attracting-surfaces, and an air-vent opening piercing the bar in the plane of said basin.

12. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying within the concavity of the pen in contact therewith and provided, contiguous to the nibs, with a non-attracting basin and with an air vent or opening piercing the same within the plane of the basin, said bar being further provided in its upper side with a longitudinally-arranged circulating-duct.

13. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying next to the pen-point at the under side thereof, and an inner feeding-shaft extension projected rearwardly into the reservoir and from the inner end of said bar, said shaft extension being disposed at one side of the plane of the feed-bar proper.

14. In a fountain-pen, the combination with the holder carrying the pen-point, of a feed-bar lying next to the pen-point and having projected from the inner side of its holding-plug a feeding-shaft extension lying against one side of the pen-bearing section or nozzle and provided in one side with a longitudinal duct.

15. In a fountain-pen, the combination with

the holder carrying the pen-point, of a feed-
bar lying within the concavity of the pen and
provided in its upper side with a non-attract-
ing basin pierced by an air-vent, and also pro-
5 vided in its upper side next to the pen with
a longitudinally-disposed circulating-duct,
and a feeding-shaft extension projected in-
wardly from the inner end of the feed-bar at
one side of the plane of the latter, said inner
10 shaft extension being provided in one side
with an open longitudinal duct.

16. In a fountain-pen, the combination with
the pen-bearing section carrying the pen-

point, of a feed-bar lying within the concavity
of the pen in continuous contact therewith 15
and having means for holding a loop of ink
in suspense across the nibs, and a vented plug
member arranged in the pen-bearing section
against and at one side of the feed-bar.

In testimony whereof I affix my signature 20
in presence of two witnesses.

PAUL E. WIRT.

Witnesses:

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R. L. ORANGE.