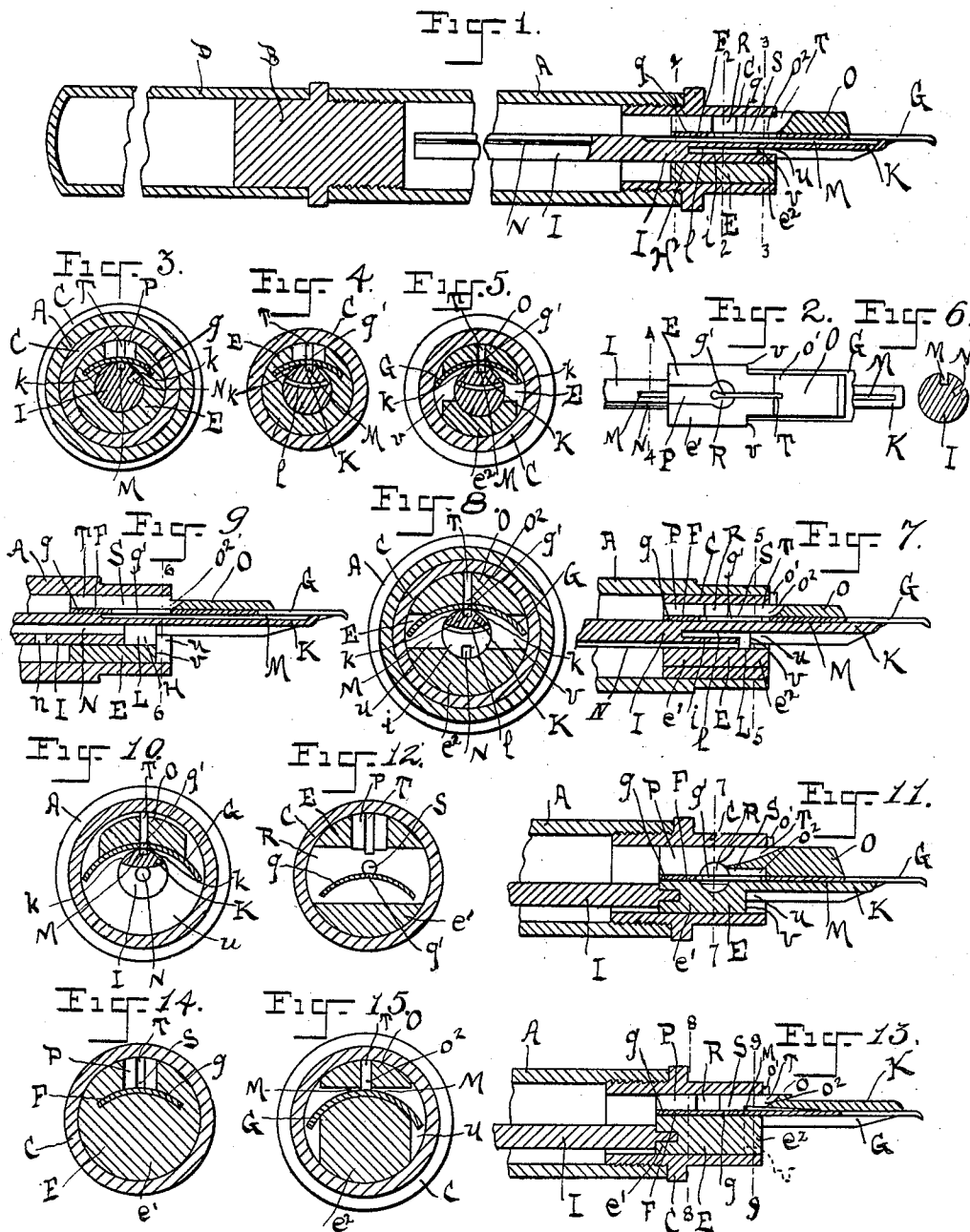


(No Model.)

L. B. WOOLFOLK.
FOUNTAIN PEN.

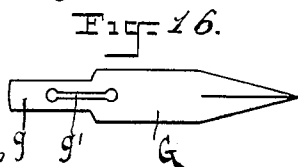
No. 481,090.

Patented Aug. 16, 1892.



WITNESSES:

Selle Hanna
Chas. Thomas



INVENTOR

Lucius B. Woolfolk

UNITED STATES PATENT OFFICE.

LUCIEN B. WOOLFOLK, OF CINCINNATI, OHIO.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 481,090, dated August 16, 1892.

Application filed May 6, 1892. Serial No. 432,054. (No model.)

To all whom it may concern:

Be it known that I, LUCIEN B. WOOLFOLK, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

This invention relates especially to fountain-pens in which the ink-holder consists of a barrel closed at the upper end and either provided with a point-section or not at its lower end. The open lower end of the ink-holder, whether the barrel be provided with a point-section or not, is closed by a stopper, preferably movable, having a transverse slot in which the pen is held. The said stopper may fit either movably or tight into a point-section forming the lower end of the ink-holder, or it may fit movably into the lower end of the barrel.

My invention aims to provide and simplify fountain-pens and to provide a fountain-pen which will write promptly, will flow freely, will not skip in writing, will not leak when reversed for use, nor flow too freely in use, and in which the entrance of air into the ink-holder and the flow of ink to the pen may be properly regulated.

To this end in the preferred form of this invention the ink-holder consists of a barrel, together with a point-section joined to the lower end thereof, and in the open lower end of said ink-holder a stopper is provided, preferably movable, though it may fit tight, said stopper being provided with a transverse slot constructed entirely within the circumference thereof, engaging and holding the pen, ducts for the passage of ink and air, a lip back of the pen, a projection upon its lower end below the pen, a longitudinal hole beneath the pen, a feed-rod traversing and held in said hole, provided with a feed-tongue integral therewith in proximity with the pen, said feed-tongue being elongated by extending up into said longitudinal hole, an ink-conduit to conduct the ink to the point of the pen, and an ink-aperture extending through the heel of the pen, communicating between this conduit and the ink-passage constructed in the stopper. The stopper is prolonged to give a firm

bearing to the pen and the feed-rod held in the longitudinal hole beneath the pen. To increase the bearing of the feed-rod in the longitudinal hole and also to promote the flow of ink to the pen, the lower portion of the feed-rod is extended down into the longitudinal hole beneath the feed-tongue, and an ink-passage is provided in the feed-rod, communicating between the longitudinal hole beneath the feed-tongue and the ink-holder. There are also other points in my invention which will be hereinafter mentioned.

In the accompanying drawings the figures are all on an enlarged scale, the better to represent the various parts of my invention.

Figures 1, 2, 3, 4, 5, and 6 represent the preferred form of my invention. Fig. 1 is a longitudinal section of a fountain-pen embodying my invention. Fig. 2 is a fragmentary plan of the stopper, pen, and feed apparatus. Fig. 3 is a cross-section on the line 1 1 of Fig. 1 looking toward the point of the pen. Fig. 4 is a cross-section on the line 2 2 of Fig. 1 looking toward the point of the pen. Fig. 5 is a cross-section on the line 3 3 of Fig. 1 looking from the point of the pen. Fig. 6 is a cross-section of the feed-rod detached on the line 4 4 of Fig. 2 looking toward the point of the pen. Figs. 7 and 8 represent a modification of my invention, of which Fig. 7 is the longitudinal section of the lower part of a fountain-pen, and Fig. 8 is a cross-section of the same on the line 5 5 of Fig. 7 looking from the point of the pen. Figs. 9 and 10 represent another modification of my invention, Fig. 9 being a longitudinal section of the lower part of a fountain-pen, and Fig. 10 a cross-section of same on the line 6 6 of Fig. 9 looking from the point of the pen. Figs. 11 and 12 represent another modification of my invention, Fig. 11 being a longitudinal section of the lower part of a fountain-pen, and Fig. 12 a cross-section of same on line 7 7 of Fig. 11 looking from the point of the pen. Figs. 13, 14, and 15 represent another modification of my invention, Fig. 13 being a longitudinal section of the lower part of a fountain-pen, and Fig. 14 a cross-section of same on line 8 8 of Fig. 13 looking toward the point of the pen, and Fig. 15 a cross-section on the

line 9 9 of Fig. 13 looking from the point of the pen. Fig. 16 is a plan view of the pen detached.

In all the drawings similar parts are designated by similar letters.

Referring to the drawings, A designates the barrel; B, a plug closing the upper end thereof; C, the point-section joined to the lower end of the barrel in any suitable manner, the barrel and the point-section together constituting the ink-holder.

D represents the ordinary protecting-cap; E, the stopper, preferably movable, in the point-section C or in the lower end of the barrel A, though it may fit tight in the point-section C.

F designates the transverse slot constructed in the stopper entirely within the circumference thereof; G, the pen held in said slot, having its upper end *g* diminished in width to fit the same; *g'*, an ink-aperture through the heel of the pen, having in either end thereof an enlargement to facilitate the flow of ink through it; H, the longitudinal hole through the stopper beneath the pen; I, the feed-rod held in the hole H; K, the feed-tongue adjacent to the pen; L, a cavity in the stopper beneath the feed-tongue; M, an ink-conduit for conveying ink to the point of the pen; *k k*, ink-spaces on either side of the feed-tongue K, between it and the wall of the longitudinal hole H; *i*, a finger integral with the feed-rod and extending below the feed-tongue down into the cavity L; *l*, a slot between the feed-tongue K and the finger *i*; N, an ink-passage communicating between the ink-holder and the cavity L underneath the feed-tongue; O, a lip integral with the stopper E and projecting back of the pen; *o'*, a stopper-check constructed on the lip; P, a longitudinal groove traversing the stopper and serving as an air and ink passage; S, the ink-duct back of the pen; *o''*, an ink-way, being a continuation of the ink-duct S, down into the lip O; T, the air-inlet back of the pen in the periphery of the stopper; R, an ink-hole communicating with the ink-aperture *g'*, the longitudinal groove P, the ink-duct F, and the air-inlet T.

e' designates the prolongation of the stopper at the upper end thereof; *e''*, a projection of the stopper integral therewith at the lower end thereof below the pen; *u*, the ink-cup below the normal lower end of the stopper, serving to catch and hold overflows of ink, and *v* the line marking the normal lower end of the stopper and the beginning of the lip O.

The barrel A may have a point-section in the lower end thereof in which the stopper is held, or a point-section may be dispensed with and the stopper be held in the lower end of the barrel A.

The stopper E may be of any desired construction which will fit either tight or movably in the open end of the point-section C or of the barrel A, contain or control the channels requisite to the operation of a fountain-pen communicating between the interior and ex-

terior of the ink-holder, hold the pen G, and carry the feed-tongue K.

The pen G may be of any suitable construction and is preferably provided with an ink-aperture in the heel thereof, though this may be varied in size or dispensed with where preferred, and the pen is preferably reduced at its upper end to fit in the transverse slot in the stopper, by which it is held, though this reduction in size need only be used where it is necessary. The ink-aperture *g'* is preferably provided with enlargements on either end; but the enlargements may be dispensed with, if preferred.

The feed-rod I may be of any well-known construction—round or angular in form—and is not essential to certain features of my invention. It may be secured in place in any manner, either by passing it through the stopper E, by connecting it thereto, or otherwise. It may extend entirely through to the lower end of the stopper and at that point be joined to the feed-tongue, or it may extend only a short distance into the stopper and be there joined to the feed-tongue, leaving a cavity in the longitudinal hole below the lower end of the feed-rod and beneath the feed-tongue. The feed-rod may have a finger constructed upon it extending into the cavity beneath the feed-tongue, or it may have no finger upon it, or the finger may extend to the lower end of the longitudinal hole or extend down only a part of the way through the same.

The feed-tongue K may be of any construction which will provide a surface adjacent to the pen G to near the point of the pen in such a manner that ink may flow in an ink-conduit from the ink-aperture to the point of the pen. The said ink-conduit may be either a groove in the top of the feed-tongue K, or it may be formed by the adjacent surfaces of the feed-tongue and the pen, conducting ink between them by capillary attraction. It may, when a groove, extend entirely through the stopper, or it may only extend to the upper end of the ink-aperture in the pen. The feed-tongue may be a separate piece, or it may constitute an extension of the feed-rod or of the stopper E. When an extension of the feed-rod, the feed-tongue may extend only to the lower end of the stopper, or it may extend up into the longitudinal hole, leaving a cavity beneath it.

The ink-passage N for conducting ink from the ink-holder into the cavity L may be a groove cut into the side of the feed-rod I, communicating between the ink-holder and the cavity-slot *l*, or it may be a groove cut in the bottom of the feed-rod, or it may be formed by so flattening the side of the feed-rod that ink may pass between it and the wall of the longitudinal hole, or it may be a groove cut in the wall of the longitudinal hole, or the feed-rod may be a tube and the ink-passage may be the hole therein, or, where the stopper fits into the lower end of the barrel A and the feed-rod is separate from the feed-tongue, the ink-

passage may be the capillary space between the feed-rod and the inner wall of the barrel A.

The lip O is formed integral with the stopper E. It should project beyond the open end of the point-section C or of the barrel A at the back or upper side of the pen G to support the pen and to facilitate manipulation of itself and the stopper. It is formed by cutting away from the lower end of the stopper up to the line *v* in such a manner that the two ends of the transverse slot F shall be cut into, so that the main body of the pen may extend up to the point *v*, which is the normal lower end of the stopper and the upper end of the lip O. The stopper may be cut away from the upper to the lower side thereof, as is represented in the preferred form of my invention, or it may be cut away in a transverse line, as is represented in Figs. 7 and 8, or it may be cut away both transversely and from the upper to the lower side, as is represented in Figs. 13 and 15. The only material point is that the portion cut away from the stopper should reach to the end of the transverse slot, so as to allow the body of the pen to extend up to the point *v*. The lip O is preferably of the same width of the transverse slot F, though its width may be varied, and of a thickness, exclusive of the stopper-check *o'*, equal to the distance between the back of the pen and the periphery of the stopper; but its thickness may be varied and it may be thinner. In length the lip may extend down not quite to the slit in the pen, or it may be shorter or longer than this, if preferred. The lip may fit close around the back of the pen, or it may in any instance be sawed across the back of the pen, as is represented in Figs. 13 and 15. When the feed-tongue is back of the pen, the lip is always sawed across, as in Figs. 13 and 15.

The stopper-check *o'* is preferably formed by constructing the lower end of the lip larger, so that it will not enter the open end of the point-section C or the barrel A; but the stopper-check may be formed by a pin fixed in the lip or other suitable manner.

The longitudinal groove P may be constructed entirely back of the pen, or it may extend beneath the pen. It may extend down to the ink-hole R, or the ink-hole may be dispensed with and the longitudinal groove extend down to the ink-duct S and the air-inlet T. The ink-hole R may be constructed back of the pen, extending from the periphery of the stopper down to the transverse slot F, or it may be constructed transversely across the stopper. In either position it will perform its office of communicating for the passage of ink and air.

The air and ink ducts may be variously constructed either wholly within the stopper or partially therein and partially in the lip, feed-tongue, and feed-rod, as desired. It is essential that they should permit the necessary outflow of ink to the pen and allow the inflow of air into the ink-holder to take its

place, and desirable that their construction should permit the regulation of this flow of ink and air by adjustment of the stopper and lip.

Referring to Figs. 1 to 6, inclusive, I will describe the preferred embodiment of my invention. In this construction the ink-holder consists of a barrel A and a point-section C, joined to its lower end by a screw. In the point-section fits the stopper E, either tight or movably. The stopper E is a solid plug formed integrally with the lip O, having a longitudinal hole H for receiving the feed-rod I, a transverse slot F for receiving the shank *g* of the pen G, a wide longitudinal groove P, serving as an ink and air passage and extending from the periphery of the stopper inwardly to the transverse slot F and from its upper end downwardly toward the lip O, and an ink-hole R, extending radially from the periphery of the stopper to the transverse slot F. The stopper has also constructed in it an ink-duct S, extending back of the pen from the ink-hole R down to the lip O and continued into the lip where it is designated the "inkway" *o'*. T is an air-inlet having its mouth open to the air below the lower end of the point-section C in such a manner that it may be contracted by pushing the stopper into the point-section up to the stopper-check *o'*, and may be enlarged by placing the stopper farther out of the point-section. The stopper-check *o'* is here formed by constructing the lower end of the lip larger, so that it will not enter the point-section C. The feed-rod I and feed-tongue K are here constructed as one integral piece, the rod I being cylindrical and held in the longitudinal hole H in the stopper, being thus held in position and extending above the stopper into and traversing the interior of the ink-holder, while its opposite end projects below the stopper, being cut away to form a thin feed-tongue K, extending adjacent to the under side of the pen G to near the point or nibs thereof. The feed-tongue K is lengthened by extending up into the longitudinal hole H, leaving a cavity L beneath it. A finger *i* is constructed below the feed-tongue, extending into this cavity L down to the lower end of the stopper. Between the feed-tongue K and the finger *i* is the cavity-slot *l*. In the top side of the feed-tongue and feed-rod is constructed the ink-conduit M, which is here a small groove for conducting ink to the point of the pen. The feed-tongue K within the longitudinal hole H is cut away on either side thereof to form the ink-spaces *k k* between the feed-tongue and the wall of the longitudinal hole H. The ink-passage N is here a groove formed in the feed-rod communicating between the ink-holder and the cavity-slot *l*. Upon the lower end of the stopper E is constructed the projection *e'*. The portion cut away from the lower end of the stopper E constitutes the ink-cup *u* for catching and holding overflows of ink. The projection *e'* is constructed to diminish by so much the area of the ink-cup

u, and thereby increase its capacity for retaining ink by capillary attraction. In operation according to this construction the ink flows through the wide longitudinal groove P into the ink-hole R and the ink-duct S and the inkway o^2 , passing through the ink-aperture g' to the under side of the pen, and thence on through the ink-conduit M to the point of the pen. Thus the longitudinal groove P and the ink-hole R provide a large passage for the ink above the pen, through which it may flow freely, while through the ink-duct S, the inkway o^2 , the ink-aperture g' , and the ink-conduit M the ink flows to the pen-point slowly by reason of the contracted passage and the capillary action. The longitudinal groove P and the ink-hole R serve to bring a full supply of ink to the lower end of the stopper E. The ink-hole R is constructed in order to bring the ink with a free full flow nearer to the lower end of the stopper than the longitudinal groove P, which is sawed with a curve, would bring it. The longitudinal groove, however, will answer very nearly as well as the ink-hole R by extending it down as far as the lower side of the ink-hole, and the ink-hole may thus be dispensed with without materially affecting the working of my invention. The ink-duct S within the stopper and the inkway o^2 within the lip O serve especially to the flow of ink from the ink-hole toward the point of the pen. The ink-duct S and the inkway o^2 may be constructed in any form other than that of a slot, which will serve to conduct ink back of the pen from the ink-hole R on toward the point of the pen.

The longitudinal groove P and the ink-hole R serve an important purpose in cutting short the ink-duct S and the air-inlet T, providing a broad passage for ink and air from the air-inlet and the ink-duct up into the ink-holder. This shortening of the narrow air-inlet and ink-duct is of much importance in facilitating the inflow of air and the outflow of ink to the pen. The ink flows through the longitudinal groove P into the ink-hole R as freely as it would were the lower side of the ink-hole the upper end of the stopper E, and the stopper is prolonged above the lower end of the ink-hole R simply to strengthen it where it is cut by the transverse slot F and to afford a firm bearing for the stopper, that it may properly carry the pen and the feed-rod and feed-tongue. This prolongation is designated e' . When so constructed, it gives a long firm bearing for the heel of the pen, which is held on either side in a groove in the prolongation formed by the transverse slot F, the center of which is cut away by the longitudinal groove P and the ink-hole R, leaving only a portion thereof as a groove on either side.

The feed-tongue K is elongated and extended up into the longitudinal hole H to increase its flexibility and its capacity for "pumping," and thus promoting the flow of ink from the ink-aperture g' to the point of the pen, and also to form the cavity L underneath it. The

finger i is constructed to secure two ends: First, it increases the bearing of the feed-rod in the longitudinal hole and holds it more firmly in position, and, second, without the finger the cavity L underneath the pen is too large to draw ink into it by capillary attraction and it remains dry; but by partially filling the cavity with the finger i the cavity-slot l that remains holds ink by capillary attraction and it constantly draws a supply of ink into it from the ink-holder through the ink-passage N and is always full of ink. The sides of the feed-tongue within the longitudinal hole H are cut away to form the ink-spaces k to draw the ink by capillary attraction from the cavity-slot l and the ink-aperture g' in the pen and pass it onto the point of the pen. By this construction the feed-tongue K within the longitudinal hole H is always surrounded by ink and never fails to pass it readily on by the ink-conduit M to the point of the pen. With this construction the ink-conduit M is equally as efficient when consisting of a capillary conduit between the adjacent surfaces of the feed-tongue and the pen as when formed by a groove in the feed-tongue. In this construction the lip O does not extend downwardly to the slit in the pen and does not conduct ink thereto, nor in any manner act as a feed-tongue; but, being integral with the stopper E, it bridges the lower end thereof, making this end solid and strengthening the stopper, which would otherwise be almost severed to provide the necessary ink and air ducts and the transverse slot for holding the pen. The lip also affords a firm finger-hold for manipulating the stopper, and its inkway o^2 serves as an extension of the ink-duct S beyond the normal lower end v of the stopper, thus leaving greater length for the passage of ink through the aperture g in the pen. The lip O further closes the lower end of the ink-duct and inkway, thus keeping the ink therein from contact with the air, except at the mouth of the air-inlet T, and it, furthermore, fits close against the back or upper side of the pen, serving to firmly support it.

The feed-rod I when integral with the feed-tongue K holds the latter firmly and it here contains a part of the ink-conduit M. The upper end of the feed-rod projecting within the barrel A expedites the flow of ink to the stopper, and the ink-passage N therein conducts the ink into the cavity L below the feed-tongue and returns ink to the ink-holder when the fountain-pen is reversed. The ink-aperture g' allows the ink to pass through it from the ink-passages above the pen to the ink-conduit M below, and it also serves as an ink duct or passage itself, carrying ink from its upper to its lower end toward the point of the pen. The aperture has enlargements at its upper and its lower end to facilitate the passage of the ink through it.

There is a great advantage in extending the ink-aperture so low down that it extends into

the body of the pen, since the flow of the ink through it is thereby brought down past the lower end of the stopper proper, and the flexibility of the feed-tongue is greater at that point and causes a ready and free flow of ink through the ink-aperture.

The air-inlet T serves especially for the admission of air into the ink-holder to take the place of the ink flowing therefrom. As the air-inlet T, below the point-section C, opens to the air within the circumference of the lip O, this portion of the air-inlet is termed its "mouth," which may be contracted by pushing the stopper E into the point-section C till the stopper-check o' strikes the point-section, and may be enlarged by drawing the stopper farther out the requisite distance. There is a great advantage in having the mouth of the air-inlet open to the air on the upper side of the lip G and in the same slot as the ink-duct S and the inkway o^2 , because the ink seals up the air-inlet until the ink, drawn away from it to the ink-duct and inkway to pass through the ink-aperture in the pen to feed the pen, opens it for a moment for the admission of air, when it is instantly sealed up again as soon as the air has entered the ink-holder. The air-inlet may be constructed in any form other than that of a slot, as shown; but the slot is preferable, since the air bubbles entering it will not gather and spread therein and thus obstruct it. The flow of ink to the pen may thus be regulated by regulating the inflow of air into the ink-holder.

It will be seen that my invention provides a simple and improved fountain-pen in which the ink flows readily, but not too rapidly, to the pen, in which the flow can always be easily controlled by regulating the inflow of air into the ink-holder to adjust it to varying circumstances, in which the ink will not dry or thicken and thereby obstruct the ducts, and from which the ink will not "gush" out in use, which is not liable to get out of order, and which may be readily cleaned of ink-deposits.

Various modifications of the structural details can be made without departing from the essential features of my invention.

The construction of fountain-pen shown in Figs. 7 and 8 closely resembles that shown in Figs. 1 to 6, inclusive, the structural differences in this instance being that, first, the ink-holder consists, as before, of a barrel A and a point-section C; but the point-section C consists of a short cylinder fitting into the lower end of the barrel A, and the stopper E is held in said cylinder; second, the ink-conduit M is not a groove in the feed-rod and feed-tongue, but the space between the contiguous feed-tongue and pen forms a capillary conduit, along which ink flows by capillary attraction to the point of the pen; third, the finger i does not extend down to the lower end of the stopper E; fourth, the ink-passage N is a groove in the bottom side of the feed-rod I; fifth, the stopper-check o' is formed by a

pin fixed in the lip O; sixth, a portion is cut away across below the normal lower end of the stopper E to form the lip O back of the pen and the projection e' below the pen, which are both broader than in the preferred form. The portion cut away from the stopper cuts into the two ends of a transverse slot F, so that the body of the pen extends to the line v . The shape of the ink-cup u is changed in this construction, being a transverse groove across the lower end of the stopper. In other respects this construction does not differ from the preferred form. Ink flows to the pen through the longitudinal groove P, the ink-hole R, ink-duct S, and inkway o^2 , and thence through the ink-aperture g' into the ink-conduit M and onto the point of the pen, as before, and the inflowing air enters through the air-inlet T and flows into the ink-holder.

The construction shown in Figs. 9 and 10 differs from the preferred form in a few particulars: First, no point-section is used, the barrel A constituting the ink-holder, the stopper E fitting into the open lower end thereof; second, there is no finger upon the lower side of the feed-rod I; third, the ink-passage N is formed by a hole traversing the feed-rod and communicating between the ink-holder and the cavity L, an opening n in the side of the feed-rod communicating between the passage N and the lower end of the ink-holder; fourth, the projection e^2 is dispensed with; fifth, the lip O is of a less thickness than the space between the pen and the periphery of the stopper E, so that the air-inlet T opens to the air partly in the lower end of the stopper within the end of the ink-holder and partly in the top side of the lip below the lower end of the ink-holder, and the lip O extends below the upper end of the slit in the pen, though it does not supply ink to the pen as it fits close to the back of the pen without any passway for ink below the inkway o^2 ; sixth, the ink-aperture g' has not any enlargements at either end thereof; seventh, the broad longitudinal groove P and the ink-hole R are dispensed with and the ink-duct F and the air-inlet T extend to the upper end of the stopper E. In this construction ink flows to the pen through the ink-duct S, the inkway o^2 , the ink-aperture g' , and the ink-conduit M, and inflowing air enters the air-inlet T and flows into the ink-holder.

The construction shown in Figs. 11 and 12 differs from the preferred form in the following points: First, there is no longitudinal hole below the pen, the feed-tongue K is constructed integrally with the stopper E, and the feed-rod I is joined to the stopper by a friction-pin; second, the ink-hole R is constructed transversely across the stopper, communicating with a longitudinal groove P, the ink-duct S, the air-inlet T, and the ink-aperture g' ; third, the ink-duct S and the inkway o^2 are constructed by a hole bored back of the pen from the ink-hole R down to the lower end of the aperture g' ; fourth, the projection e^2 is

dispensed with. In this construction the ink-holder consists of the barrel A and the point-section C, as in the preferred form of my invention, and the stopper fits into the point-section C and ink flows to the pen through the longitudinal groove P, the ink-duct S, the inkway o^2 , the aperture g' , and the ink-conduit M, and inflowing air enters by the air-inlet T and passes into the ink-holder.

The construction shown in Figs. 13, 14, and 15 differs from the preferred form in several points: First, the feed-tongue K is above or back of the pen, being integral with the lip O and the stopper E. The bottom side of the feed-tongue K and the lip O next the pen G is cut away to form the ink-conduit M, which extends up through the lip O to or near the normal lower end of the stopper v , communicating with the inkway o^2 and the ink-duct S, and also with the ink-cup u , so as to allow overflows of ink to discharge into it; second, there is no longitudinal hole beneath the pen. The projection e^2 extends up to the bottom side of the pen and the feed-rod I is separate from the feed-tongue and is joined to the stopper by a friction-pin, and there is no ink-aperture in the pen. In this construction the ink-holder consists of the barrel A and the point-section C, as in the preferred form. Ink flows from the ink-holder to the point of the pen through the longitudinal groove P, the ink-hole R, the ink-duct S, the inkway o^2 , and thence through the ink-conduit M back of the pen onto the pen-point, and inflowing air enters the air-inlet and passes into the ink-holder as before.

In all the foregoing forms of construction it is immaterial whether the ink-holder consists of a barrel A alone or of a barrel A and a point-section C, since both are equally well-known forms of construction and are equally applicable to the features of my invention.

I have obtained a patent for improvement in fountain-pens, issued August 11, 1891, No. 457,470, which presents certain features similar to my present invention. In that patent a stopper fits into the lower open end of the ink-holder, provided with a transverse slot for holding the pen and with a longitudinal groove and an ink-duct back of the pen. The transverse slot for holding the pen, the longitudinal groove, and the ink-duct in that patent are identical with the same features of my present invention, except that in my present invention the ink-hole R intervenes between the longitudinal groove and the ink-duct; but really in my present invention the ink-hole R is merely a continuation or extension downward of the longitudinal groove P and may practically be considered as a part thereof; but there is no other similarity between that patent and my present invention. That patent has no point-section, no lip back of the pen, no air-inlet with its mouth in the upper side of the stopper, no inkway o^2 , no ink-aperture in the pen for the passage of ink to the point of the pen, no longitudinal hole H, no

feed-tongue below the pen, no feed-rod integral with the feed-tongue, no projection e^2 , no ink-hole R, nor any of the other distinguishing features of my present invention. I do not wish to claim anything presented in that patent, but only those features which are new and peculiar to my present invention.

What I claim is—

1. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-holder, provided with a transverse slot constructed entirely within a circumference thereof and extending entirely through said stopper, a pen held in said transverse slot, a feed-tongue below the pen, and ducts and passages for permitting an outflow of ink from the ink-holder to the point of the pen and an inflow of air into the ink-holder.

2. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-holder, adapted to hold a pen and provided with a rigid lip integral therewith, located back of the pen, extending beyond the end of the stopper and a portion thereof in contact with the inner wall of the ink-holder, and ducts and passages whereby air may enter the ink-holder and ink may flow out of the ink-holder to the point of the pen.

3. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-holder, provided with a transverse slot constructed entirely within the circumference thereof and extending entirely through said stopper, a pen held in said slot, a feed-tongue below the pen and a longitudinal groove back of the pen, and means whereby air may enter the ink-holder and ink may flow out of the ink-holder to the point of the pen.

4. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-holder, a pen held in the stopper, said stopper provided with an ink-hole, a wide groove or passage extending from the ink-holder to the ink-hole, and a narrow ink duct or passage from the ink-hole to conduct ink to the pen, all substantially as described.

5. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-holder, adapted to hold a pen and provided with a rigid lip integral therewith, located back of the pen, and an inkway constructed in the lip, substantially as and for the purpose set forth.

6. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-holder, a pen held in the stopper, said stopper provided with a lip integral therewith, located back of the pen, and an air-inlet back of the pen, constructed partly in the periphery of the stopper and partly in the periphery of the lip, substantially as described.

7. In a fountain-pen, the combination of an ink-holder closed at the upper end, with a stopper in the open lower end of the ink-holder, a pen held in the stopper, said stopper provided with a longitudinal hole, located
5 entirely beneath the pen, a feed-rod held in said longitudinal hole, provided with a feed-tongue integral therewith adjacent to the pen, and a projection extending downward below
10 the pen, substantially as described.

8. In a fountain-pen, the combination of an ink-holder closed at the upper end, a stopper in the open lower end of the ink-holder, adapted to hold a pen and provided with a longitudinal
15 hole therein, located entirely beneath the pen, a feed-rod held in said longitudinal hole, having a feed-tongue integral therewith, a projection integral with the stopper below the pen, and an ink-cup below the normal lower end
20 of the stopper and located between the pen, the feed-tongue, the inner wall of the ink-holder, and said projection, substantially as described.

9. In a fountain-pen, a stopper adapted to hold a pen and provided with a rigid lip located back of the pen, said lip having a stopper-check, substantially as and for the purpose set forth.

10. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a
30 stopper in the open lower end of the ink-holder, provided with a longitudinal hole below the pen, a feed-rod held in the longitudinal hole, having the under side of its lower end cut away to form a feed-tongue,
35 said cut-away portion of the feed-rod extending up into the longitudinal hole, thereby lengthening the feed-tongue, and ducts and passages whereby air may enter the ink-holder and ink may flow from the ink-holder
40 to the point of the pen.

11. In a fountain-pen, the combination, with an ink-holder, of a stopper in the lower end of the ink-holder and a pen held in the stopper, said stopper provided with a longitudinal
45 hole located entirely beneath the pen, a feed-rod held in said longitudinal hole and having the under side of its lower end cut away to form a feed-tongue, and ducts and passages for the inflow of air into the ink-holder and the outflow of ink to the point of
50 the pen.

12. In a fountain-pen, the combination, with a stopper having a pen-holding slot and provided with a longitudinal hole below the pen-slot, of a feed-rod adapted to be held in the
55 longitudinal hole, said feed-rod having the under side of its lower end cut away to form a feed-tongue, the cut-away portion of the rod extending up into the longitudinal hole, whereby the feed-tongue is lengthened and a
60 cavity is formed in the stopper beneath the feed-tongue, substantially as described.

13. In a fountain-pen, a feed-rod having a portion cut away from the under side of its
65 lower end to form a feed-tongue, a finger below said feed-tongue integral with the under portion of said feed-rod, and a slot between

the feed-tongue and finger, substantially as described.

14. In a fountain-pen, the combination of a
70 stopper having a slot to hold a pen and provided with a longitudinal hole beneath the pen-slot, with a feed-rod held in said longitudinal hole, provided with a feed-tongue integral therewith, the under side of the lower
75 end of said feed-rod being cut away to form an elongated feed-tongue and to form a cavity in the stopper beneath the feed-tongue, and a finger integral with the under side of the feed-rod, extending down into the cavity
80 beneath the feed-tongue, substantially as and for the purpose set forth.

15. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-
85 holder, holding a pen and provided with a longitudinal hole below the pen, a feed-rod held in the longitudinal hole, a feed-tongue, and an ink-passage communicating between the ink-holder and the longitudinal hole beneath
90 the feed-tongue, substantially as and for the purpose set forth.

16. In a fountain-pen, the combination, with a stopper holding a pen and provided with a longitudinal hole beneath the pen, of a feed-
95 rod adapted to be held in said longitudinal hole, having the under side of its lower end cut away to form a feed-tongue, said feed-tongue cut away on each side to form ink-spaces between the feed-tongue and the wall
100 of the longitudinal hole, substantially as described.

17. In a fountain-pen, the combination of an ink-holder closed at the upper end, with a stopper in the open lower end of the ink-
105 holder, a pen held in the stopper, said stopper provided with a lip integral therewith, located back of the pen, and an air-inlet in the periphery of the stopper and lip, the inlet having its mouth open to the air on the up-
110 per side of the lip below the lower end of the ink-holder, and ducts and passages for conducting air from the air-inlet into the ink-holder and ink from the ink-holder to the point of the pen.
115

18. In a fountain-pen, the combination of a stopper provided with a transverse slot constructed entirely within the circumference thereof, a pen held in the transverse slot, an ink-duct back of the pen, and a feed-tongue
120 below the pen, substantially as described.

19. In a fountain-pen, the combination, with an ink-holder closed at the upper end, of a stopper in the open lower end of the ink-holder, provided with a pen having an ink-
125 aperture in the heel thereof, a feed-tongue below the pen, and ducts and passages whereby air may enter the ink-holder and ink may flow from the ink-holder to the top side of the ink-aperture in the pen and passing
130 thence through said aperture to the feed-tongue below the pen flow onto the point of the pen.

20. In a fountain-pen, the combination of

an ink-holder closed at the upper end, with a stopper in the open lower end of the ink-holder, having a prolongation extending within said ink-holder and provided with a transverse slot constructed entirely within the
5 circumference of the stopper and traversing said prolongation, a pen having the heel thereof held in said transverse slot in said prolongation, and ink and air ducts for per-
10 mitting the inflow of air into the ink-holder

and the outflow of ink from the ink-holder to the point of the pen.

Signed at New York, in the county of New York and State of New York, this 4th day of May, A. D. 1892.

LUCIEN B. WOOLFOLK.

Witnesses:

M. S. POWERS,
A. L. HALL.