

No. 651,738.

Patented June 12, 1900.

P. E. WIRT.
FOUNTAIN PEN.

(Application filed Feb. 6, 1900.)

(No Model.)

2 Sheets—Sheet 1.

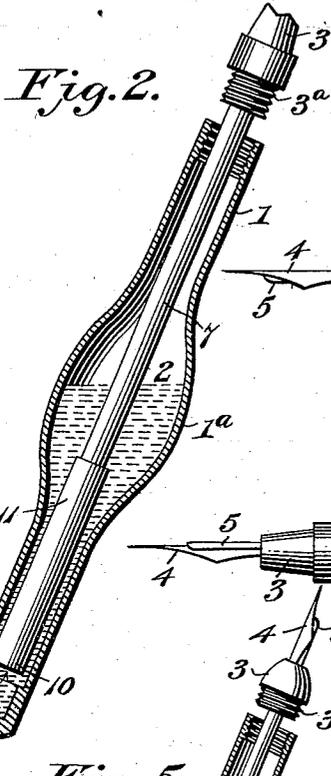
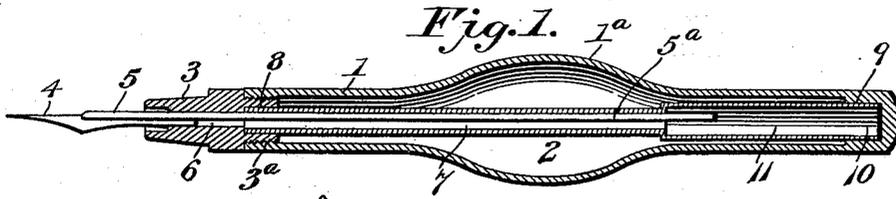


Fig. 3.

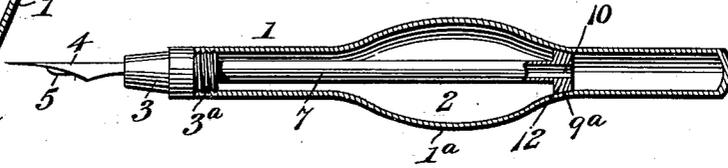


Fig. 4.

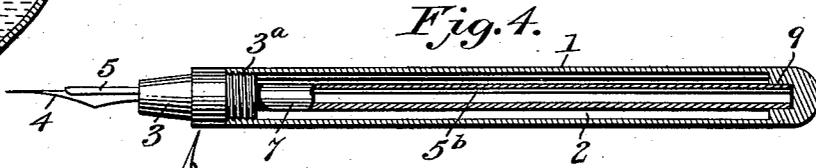


Fig. 5.

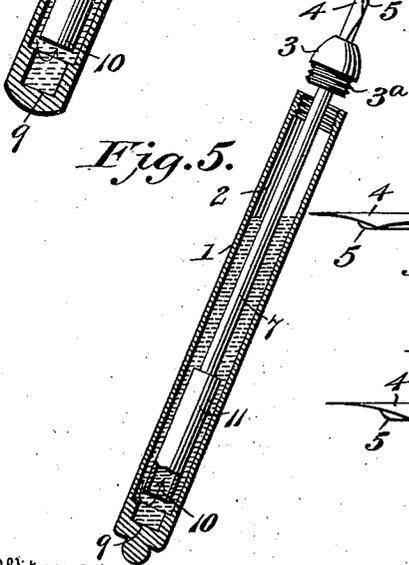
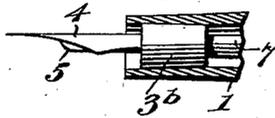


Fig. 6.



Fig. 7.



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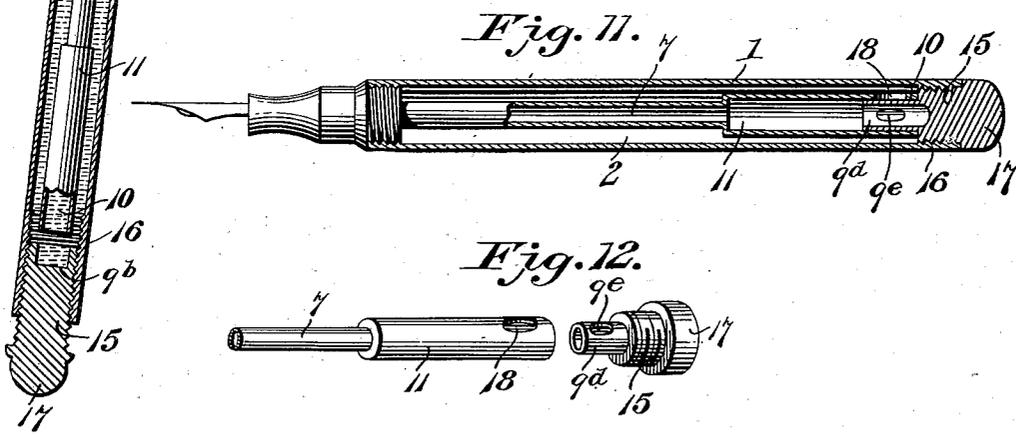
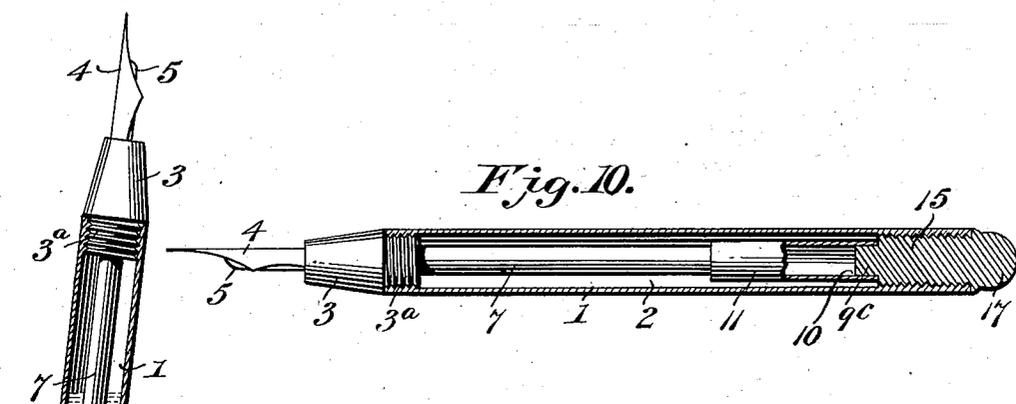
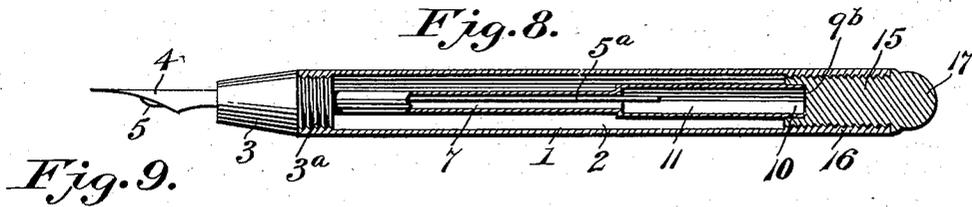
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

PAUL E. WIRT, OF BLOOMSBURG, PENNSYLVANIA.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 651,738, dated June 12, 1900.

Application filed February 6, 1900. Serial No. 4,218. (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 of the type in which there are provided well-defined separate main supply and service reservoirs in addition to or apart from the duct leading to the pen, and which reservoirs respectively hold the main reserve supply of ink and a separate comparatively-limited supply for service, whereby the proper flow of ink to the pen may be regulated to obviate flooding or blotting. This type of fountain-pens is disclosed in my pending applications, Serial No. 739,298, filed December 5, 1899, and Serial No. 3,483, filed January 13, 1900.

In the constructions disclosed in the aforesaid applications there is provided in connection with the main supply and service reservoirs suitable means for permitting of the convenient replenishing of the supply of ink in the service-reservoir from the said main supply-reservoir whenever this is necessary, while at the same time providing for totally cutting off communication between the two reservoirs when the pen is either in or out of use, but which means are primarily designed to cut off communication from the main supply of ink in the main reservoir as long as there is a sufficient quantity of ink in the service-reservoir for supplying the pen.

The present invention contemplates a novel form and arrangement of supplemental service-reservoir which is so associated with the main reservoir and the other parts of the pen as to provide a proper limited or graduated supply of ink for use at the pen, while at the same time permitting a maximum reserve-supply of ink to be held within the main reservoir of the holder or outer case.

The invention also has in view the novel formation and mounting of the interior supplemental service-reservoir, whereby such supplemental service-reservoir may inclose as large a supply of ink for the pen as may be necessary for immediate use, thus rendering it unnecessary to frequently manipulate the pen to refill the service-reservoir.

Another object of the invention is to mount the supplemental service-reservoir in such a way with relation to the different parts of the pen and to associate with the filling end thereof suitable cut-off means whereby the ink may be admitted to the said service or interior reservoir through the upper or outer end thereof when the penholder is inverted with the pen-point upward, thus entirely obviating the possibility of any ink running from or off of the pen, such as might possibly occur in filling the interior or service reservoir with the pen-point disposed downward, which is the operation involved in the principal forms disclosed in my aforesaid applications.

With these and other objects in view the invention consists in the novel construction, combination, and relation of parts hereinafter described, illustrated, and claimed.

The fundamental features of the present invention are necessarily susceptible to a wide range of modification without departing from the spirit or scope thereof; but the preferred embodiment of the improvements is shown in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of the double-reservoir fountain-pen, showing the interior tubular supplemental service-reservoir seated to cut off communication between the two reservoirs, while permitting of communication between the ink-duct and the said supplemental service-reservoir. Fig. 2 is a similar view showing the pen inverted and illustrating how the pen is manipulated to provide for filling the main case or the service-reservoir. Fig. 3 is a longitudinal sectional view of the pen, showing a modification of the interior supplemental service-reservoir associated with the swelled form of holder. Fig. 4 is a longitudinal sectional view showing a modification in which the tubular supplemental service-reservoir is associated with a straight form of holder or barrel. Fig. 5 is a view similar to Fig. 4, showing the pen inverted and also illustrating the form of service-reservoir having an enlarged ink-chamber in connection with the straight form of holder or barrel. Fig. 6 is a sectional view showing the straight holder or barrel combined with the form of service-

reservoir illustrated in Fig. 3. Fig. 7 is a detail sectional view of one end portion of the pen, illustrating a modified form of joint for the removable pen-bearing section or nozzle. Fig. 8 is a longitudinal sectional view showing a modified construction in which the covering and uncovering of the open filling end of the supplemental reservoir-tube may be accomplished by other means than the removal and replacing of the pen-bearing section or nozzle. Fig. 9 is a similar view showing the pen inverted, illustrating how the seat-plug is moved away from the open filling end of the supplemental reservoir-tube to permit of the filling of the latter from the main reservoir of the holder or case. Fig. 10 is a longitudinal sectional view of the pen, showing a modified form of the adjustable seat-plug, upon which is provided the interior cut-off seat for the open filling end of the interior reservoir-tube. Fig. 11 is a longitudinal sectional view showing another modification in which the cut-off seat for the filling end of the service-reservoir is in the form of a rotary valve. Fig. 12 is a detail in perspective illustrating the valve construction shown in the modification to Fig. 11.

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

The present invention, like those disclosed in my aforesaid applications, contemplates constructing the fountain-pen with separate interior main supply and supplemental service reservoirs in addition to the usual ink-duct leading to the pen, whereby the supplemental or inner service-reservoir shall be separate and distinct from the ink-duct with which fountain-pens are usually provided; but the improvements contemplated by the present invention relate specifically to the construction and mounting of the supplemental service-reservoir to attain the objects pointed out, and as this fundamental feature underlies the invention such feature may be embodied in a variety of modifications, such as illustrated in the drawings, and to which modifications particular reference will now be made.

The invention *per se* is not only susceptible to a variety of modifications, but is also applicable to different forms or shapes of holders, and in Fig. 1 of the drawings the holder or barrel is illustrated as of the swelled type shown in the other applications. In the drawings the said holder is designated by the numeral 1 and is formed with an intermediate annular enlargement or swelled portion 1^a and is constructed with a large interior main supply-reservoir 2, which occupies the greater portion of the holder or barrel and is of a maximum capacity, so as to retain a large supply of ink adapted to be held in reserve for use in replenishing the service-reservoir, hereinafter referred to. In this form of the holder, as well as in all other forms, the same may be provided at one end

thereof with any suitable form of pen-bearing section or nozzle 3, having a detachable joint connection with the lower open end of the holder or outer case 1, which detachable connection may be either in the form of a screw-joint 3^a, as shown in Fig. 1, or in the form of a slip-joint 3^b, as shown in detail Fig. 7 of the drawings, either of which forms of joints would permit of the ready removal and replacing of the pen-bearing section or nozzle, while at the same time providing a tight closure for the lower open end of the holder of outer case 1 to prevent leakage at this point. The said detachable pen-bearing section or nozzle 3 carries a pen-point 4 and a feeder 5, as well as being constructed with the usual ink-duct 6; but it will be understood that in carrying out the invention any type of plain feeder may be employed, as well as any arrangement of these members, without affecting the novel function of the supplemental service-reservoir. It is only necessary that there be employed some approved means for delivering the ink to the pen by capillary attraction; but the present invention contemplates, in addition to the ink-duct 6, irrespective of the position or formation of this duct, and also in addition to the main supply or reserve reservoir 2, a supplemental service-reservoir 7, the total interior space or area of which is made as large as possible without unnecessarily increasing the size or proportion of the pen and for practical purposes is ordinarily of a sufficient size to inclose or hold as large a supply of ink as may be necessary for immediate use to the pen, thereby obviating the necessity of frequently refilling the said service-reservoir. In all forms of the present invention the said supplemental service-reservoir 7 is in the form of a tube arranged longitudinally within the holder or outer case 1 and of a materially less diameter than the same to permit of the necessary supply of ink being held within the main reserve or supply reservoir 2. The said reservoir-tube 7 is preferably designed to be carried by and removable with the pen-bearing section or nozzle 3, and to this end one of the open ends of the reservoir-tube may be permanently or fixedly fitted within a socket 8 at one end of the pen-bearing section or nozzle 3, so as to be in direct communication with the ink-duct 6 of said section or nozzle, although it will be understood that any mechanical expedient may be resorted to for connecting these two parts together whereby the ink-duct and the reservoir-tube 7 will be in permanent communication, and the said tube will, in effect, constitute a fixed part of the pen-bearing section or nozzle, so that it can be removed or replaced with said nozzle, whereby the latter may constitute a controlling or manipulating means for the supplemental service-reservoir tube.

When the supplemental service-reservoir tube has its supply of ink for the pen, it is

necessary to have the communication between the two reservoirs closed, and to secure this result the holder or outer case 1 is provided with some form of interior cut-off seat, one form of which is designated by the numeral 9 and with which coöperates the open filling end 10 of the supplemental-reservoir tube opposite the open end, which is joined to the pen-bearing section or nozzle 3. In the form of the invention shown in Fig. 1 of the drawings the interior cut-off seat 9 is located at the extreme outer or upper end of the holder or case 1, and the said seat practically constitutes a counterbored portion of a less diameter than the main portion of the holder or case, but of the same diameter as that of the open filling end of the tube, which registers therein. When the reservoir-tube is manipulated to withdraw its open filling end 10 from the cut-off seat 9, the said open filling end is placed in direct communication with the interior or main reservoir 2 of the holder 1, thus permitting of the refilling or replenishing of the reservoir-tube, and when said open end of the reservoir-tube is again carried into the seat 9 communication between the two reservoirs is totally cut off, while at the same time not interfering with the free feeding or delivery of the ink from the supplemental reservoir to the ink-duct 6 and thence to the pen.

Inasmuch as the interior reservoir-tube 7 is necessarily small, it may be desirable in some cases to make provision that will insure the same inclosing as large a supply of ink as may be necessary for the ordinary use of the pen at one time. This may be accomplished by constructing the tube (preferably adjoining the open filling end 10 thereof) with an enlarged ink-chamber 11, which simply forms an enlarged portion of the main portion of the tube, but necessarily increases the holding capacity thereof. Also by reason of the comparatively-small diameter of the interior reservoir-tube 7 it is preferable to provide means for positively insuring the attraction of ink downward to the pen and back into the reservoir when the pen is inverted. Different expedients may be utilized for this purpose—such, for instance, as shown in Fig. 1 of the drawings, and which consists of having the feeder 5 provided with an extended stem or bar 5^a, running longitudinally within the tube 7 for the greater portion of its length, or the tube may be provided within its bore with a capillary channel 5^b, as shown in Fig. 4 the drawings; but either of these expedients or other equivalent means would accomplish the necessary free flow of the ink down and back within the reservoir, while at the same time permitting of the use of an interior reservoir-tube with a sufficiently-contracted bore to prevent flooding or sudden dropping of the ink to the pen.

It is obvious in the forms described that when the pen is inverted and the pen-bearing section or nozzle detached to carry the open filling end of the reservoir-tube away

from its seat the ink within the main reservoir 2 will enter the open end of the reservoir-tube and rise within said tube to its level within the main reservoir, as plainly shown in Figs. 2 and 5 of the drawings. So when the column of ink within the holder or case in its inverted position equals or exceeds the length of the enlarged ink-chamber 11 such chamber will be necessarily completely filled, and will thus insure the supplemental reservoir holding a sufficient supply of ink for immediate use to the pen.

In the form of the invention shown in Fig. 3 the interior reservoir-tube 7 is not provided with the enlarged ink-chamber 11, but in place thereof is formed at the open filling end 10 thereof with a head or disk portion 12, adapted to work onto the interior seat 9^a, formed at a point intermediate the ends of the main holder or outer case 1, whereby the outer or upper portion of said holder or case will constitute an ink-holding chamber which is in communication with the supplemental service-reservoir tube 7 when the same is closed upon its seat 9^a. In other respects the action and functions of the tube as shown in Fig. 3 are the same as in the other form already described.

While in Figs. 2 and 3 the improvements are shown in connection with the swelled form of holder, the same are equally useful in connection with the straight form of holder or barrel illustrated in Figs. 4, 5, and 6 of the drawings. In Figs. 4 and 5 the same form of interior cut-off seat 9 is employed as shown in Figs. 1 and 2, although in Fig. 4 the reservoir-tube 7 is shown straight throughout, while in Fig. 5 the same is illustrated as provided with the enlargement or ink-chamber 11. In Fig. 6 of the drawings the same form of supplemental service-reservoir tube 7 as illustrated in Fig. 3 is shown associated with the straight form of holder having the intermediate cut-off seat.

Although in the described forms of the invention the interior cut-off seat 9 or 9^a maintains a fixed position, so that the pen-bearing section or nozzle constitutes the controlling means for opening up and closing communication between the service-reservoir and the main supply-reservoir, still a modification may be resorted to in which this relation of parts is reversed—that is, having the interior or supplemental service-reservoir tube remain fixed within the holder or outer case, while the cut-off seat is adjustable or movable, so as to cover and uncover the open filling end of the tube. Such a modification of the invention is shown in Figs. 8, 9, and 10 of the drawings, and referring particularly to Fig. 8 of the drawings it will be seen that the result referred to may be accomplished by employing an adjustable seat-plug 15, having a threaded portion working in the threaded upper or outer end 16 of the holder 1 and also provided with an interior cut-off seat 9^b and an exterior finger-knob 17, which is grasped

by the fingers to provide for turning the plug in and out of the threaded portion 16 of the holder. In Fig. 8 of the drawings the cut-off seat 9^b is in the form of a socket or recess similar to the seat 9 shown in some of the other forms of the invention and is adapted to fit over or receive the open filling end of the supplemental service-reservoir tube when the plug 15 is screwed into place; but by unscrewing this plug to carry the seat 9^b away from the open filling end of the service-reservoir tube, as shown in Fig. 9, said tube may be readily refilled from the main supply-reservoir. In Fig. 10 of the drawings the plug 15 is shown provided with a modified form of cut-off seat 9^c, having a projecting stem portion adapted to work in and out of the open filling end of the reservoir-tube, and in this connection it will of course be understood that any suitable formation of seat may be provided on the adjustable plug 15 and the latter associated with either the straight or swelled form of holders without departing from the invention.

25 In all forms of the present invention the main object is to provide a construction in which suitable cut-off means will be associated with the filling end of the interior reservoir-tube, whereby ink may be admitted to such tube at the upper end thereof, while the penholder is held in an inverted position with the pen-point disposed upwardly, thus avoiding the possibility of any ink running from or off of the pen, which might occur in filling the interior reservoir-tube with the penholder in the usual position and the pen-point disposed downwardly, such operation being involved in connection with the principal forms disclosed in my aforesaid applications.

40 It is therefore unimportant in carrying out the present invention what particular kind of cut-off means are employed in connection with the upper filling end of the interior reservoir-tube. In some of the forms described the cut-off means consists of a fixed seat in connection with the tube, being movable with the detachable pen-bearing section, while in another form the cut-off means is shown as consisting of an adjustable seat-plug 15, movable to and from the filling end of the interior service-tube, and another modification similar to this construction is shown in Figs. 11 and 12 of the drawings, said latter modification also involving a seat-plug 15, threaded in the upper or outer end 16 of the holder and provided with an exterior finger-knob 17.

55 In this form of the invention, however, the seat-plug 15 is provided with a tubular stem portion 9^d, working within the open filling end of the reservoir-tube, and provided with a lateral port 9^e, adapted to be turned in and out of register with a corresponding port 18, formed in the side of the interior service-reservoir tube, contiguous to the open upper end thereof. This construction, in effect, constitutes a rotary valve, and it is simply necessary to turn the seat 15 in either direction to

provide for opening or closing communication between the main supply-reservoir 2 and the service-reservoir 7. In refilling the main supply-reservoir 2 this may be accomplished by removing the pen-bearing section and the tube carried thereby, as in the other forms of the invention.

The modification described has only been illustrated in connection with the straight form of holder and with the service-tube having the enlarged ink-chamber 11; but it is of course obvious that the cut-off could be associated with the plain form of tube shown in Fig. 4 and also with the swelled form of holder shown in Fig. 1 without departing from the spirit or scope of the invention.

Other modifications will readily suggest themselves to those skilled in the art, and I would have it understood that various changes in 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 is claimed as new, and desired to be secured by Letters Patent, is—

1. In a fountain-pen, the holder having separate interior main supply and service reservoirs, in addition to the ink-duct leading to the pen, said service-reservoir being in the form of a tube spaced from the walls of the main reservoir to leave an intervening ink-space, said tube being carried at one end by the pen-bearing section, and provided at its free end with an opening to permit of the ink being fed therein by hydrostatic pressure when the pen is inverted.

2. In a fountain-pen, the holder provided with separate interior main supply and service reservoirs in addition to the ink-duct leading to the pen, the service-reservoir being in the form of a tube carried at one end by the pen-bearing section, and spaced from the walls of the main reservoir to leave an intervening ink-space, said tube being also provided at its free end with a filling-opening through which the ink is fed by hydrostatic pressure, and cut-off means associated with the reservoir-tube to maintain a separate supply of ink in both reservoirs at the same time.

3. In a fountain-pen, the holder provided with the main supply-reservoir, the pen-bearing section, an interior supplemental service-reservoir tube open at both ends and having one of such ends joined to the pen-bearing section, the said reservoir-tube being spaced from the walls of the main reservoir to leave an intervening ink-space, and extending substantially the full length of the holder, whereby ink may be fed through the farther end thereof by hydrostatic pressure.

4. A fountain-pen holder provided with a main reservoir, a pen-bearing section, an interior reservoir-tube open at both ends and having one of such ends joined to the pen-bearing section, said tube being spaced from the walls of the main reservoir to leave an

intervening ink-space and extending longitudinally within the holder a greater portion of its length, whereby ink may be fed through its farther end by hydrostatic pressure, and means, including said pen-bearing section, for totally cutting off communication between the two reservoirs when both are supplied with ink.

5. In a fountain-pen, the holder provided with the main supply-reservoir and an interior cut-off seat, a pen-bearing section having a detachable connection with the holder, and a reservoir-tube connected at one end with the pen-bearing section and provided with an opening at its free end, said tube extending longitudinally within the holder for the greater portion of the latter, and spaced from the walls of the main reservoir to leave an intervening ink-space whereby ink may be fed through the free end of the tube by hydrostatic pressure, said tube being adapted to have its filling end cooperate with said seat.

6. In a fountain-pen, the holder provided with the main supply-reservoir and an interior cut-off seat, a detachable pen-bearing section, and an interior reservoir-tube open at both ends and having one of such ends rigid with the pen-bearing section, said tube being adapted to have the filling end thereof carried into and out of the interior seat, and also being spaced from the walls of the main reservoir to leave an intervening ink-space and extending longitudinally within the holder the greater portion of the length of the latter, whereby ink may be fed through the farther end of the tube by hydrostatic pressure.

7. In a fountain-pen, the holder provided with a main supply-reservoir and with an interior cut-off seat, a detachable pen-bearing section, and an interior reservoir-tube spaced from the walls of the main reservoir to leave an intervening ink-space between the two reservoirs, said reservoir-tube being open at both ends, and having one of said ends rigid with the pen-bearing section, the opposite open end of the tube being adapted to be carried into and out of the interior seat by the manipulation of the pen-bearing section, and arranged to have the ink fed therein by hydrostatic pressure.

8. In a fountain-pen, the holder provided with the main supply-reservoir, and an interior cut-off seat, a detachable pen-bearing section, and a separate interior supplemental service-reservoir tube open at both ends and joined at one end to the pen-bearing section,

said tube being spaced from the walls of the main reservoir to leave an intervening ink-space extending longitudinally within the holder for the greater portion of the length of the latter and provided at the farther end with an enlargement forming an ink-chamber, substantially as described.

9. In a fountain-pen, the holder having the main supply-reservoir, the pen-bearing section, a service-reservoir tube arranged longitudinally within the holder and communicating at one end with the ink-duct of the pen-bearing section, said tube being spaced from the walls of the main reservoir to leave an intervening ink-space between the two reservoirs, and being provided with a filling-opening and means for permitting ink to be fed through the filling-opening of the service-reservoir tube by hydrostatic pressure with the holder in an inverted position, substantially as described.

10. In a fountain-pen, the holder having the main supply-reservoir, the pen-bearing section, a service-reservoir tube arranged longitudinally within the holder and spaced from the walls of the main reservoir to leave an intervening ink-space, said tube being open at both ends, one of said ends of the reservoir-tube being fitted to the pen-bearing section and in communication with the ink-duct thereof, and cut-off means associated with the opposite open end of the tube, said tube being arranged to permit the ink to be fed through such end by hydrostatic pressure when the holder is in an inverted position.

11. In a fountain-pen, the holder having a main supply-reservoir, a pen-bearing section, an interior supplemental reservoir-tube arranged within the holder and spaced from the walls of the main reservoir to leave an intervening ink-space between the two reservoirs, said tube being permanently in communication with the ink-duct of the pen-bearing section and having a filling-opening, and cut-off means for the filling-opening, said opening and cut-off means being arranged to permit of the ink being fed into the inner tube from the ink-space by hydrostatic pressure, substantially as set forth.

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. W. FUNSTON,
C. C. PEACOCK.