No. 651,737.

Patented June 12, 1900.

P. E. WIRT.

FOUNTAIN PEN.

(Application filed Jan. 31, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

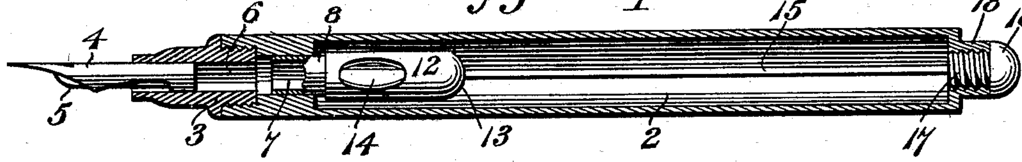


Fig. 2.

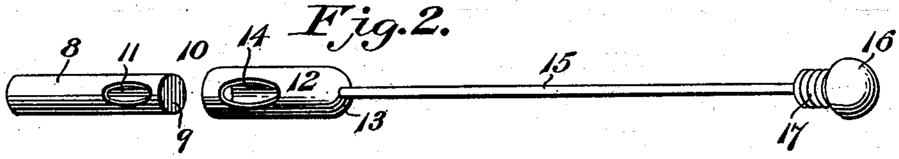


Fig. 3.

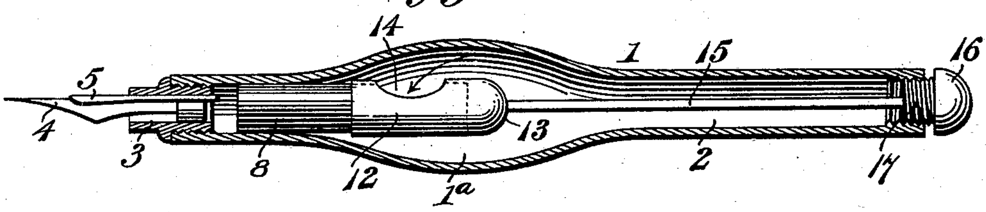


Fig. 4.

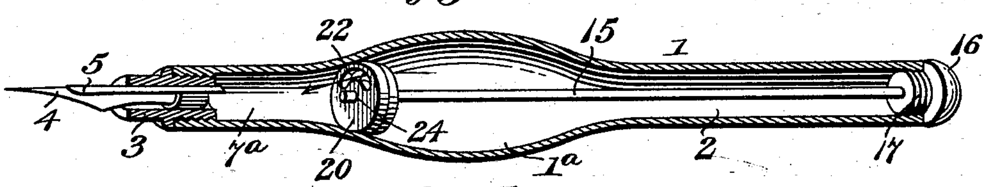


Fig. 5.

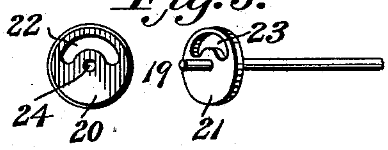
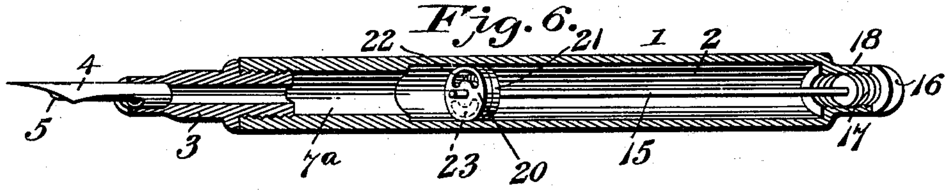


Fig. 6.



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No. 651,737. Patented June 12, 1900.

P. E. WIRT.

FOUNTAIN PEN.

(Application filed Jan. 31, 1900.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 7.

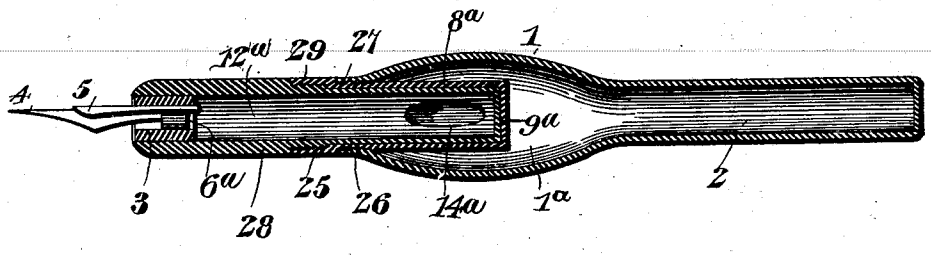


Fig. 8.

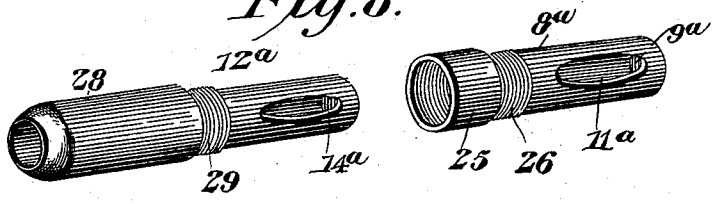


Fig. 9.

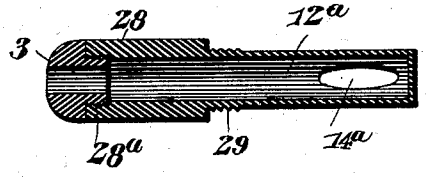
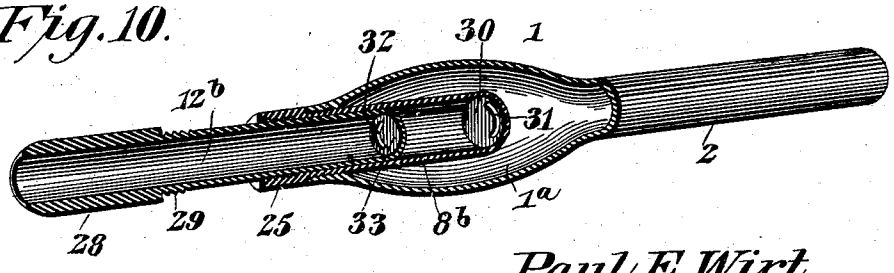


Fig. 10.



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FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 651,737, dated June 12, 1900.

Application filed January 31, 1900. Serial No. 3,483. (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, and more especially to the means for controlling the supply of ink for the pen, and in this particular is designed principally as an improvement upon the invention set forth in my pending application, Serial No. 739,298, filed December 5, 1899.

In the form of fountain-pen disclosed in the aforesaid application the holder or barrel is provided with 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 supply of ink and a predetermined supply for service. In the said construction there is also associated with the said two reservoirs, suitable means for totally cutting off communication between the two reservoirs, when the pen is either in or out of use, but which means is 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. In the above-described construction disclosed in the said pending application the different forms of valves employed have a longitudinal movement within the holder or barrel, thereby necessitating the employment of a rod or stem which must be withdrawn and pushed in again in the manipulation of the valve; and the main and primary object of the present invention is to dispense with the use of valves of this character and to substitute in place thereof a suitable valve which will not only constitute the separating-diaphragm between the two reservoirs of the holder, but will also be provided with a member rotatable in substantially the plane within which the valve is located, thereby rendering the structure cheaper and easier to make, besides being cleaner to operate, by dispensing with a sliding rod or stem and obviating the necessity of making provision for the protection of joints.

With these and other objects in view, which will readily suggest themselves to those skilled in the art as the nature of the invention is better understood, the same consists in the novel combination and relation of parts hereinafter more fully described, illustrated, and claimed.

Broadly speaking, the invention contemplates the employment of a valve occupying a fixed location between the main and supplemental reservoirs of the holder, which valve includes a rotary member having no appreciable movement away from the plane in which the valve is located, and, specifically, the invention contemplates a movable valve member having a rotary or axial movement; but the particular type of valve used for the purpose stated is necessarily susceptible to a variety of modifications without departing from the spirit or scope of the invention, yet the preferred form of valve utilized in carrying out the invention is shown in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a fountain-pen fitted with one form of valve, which form of valve not only acts as a cut-off, but also forms the supplemental service-reservoir, which is in communication with the ink-duct of the pen. Fig. 2 is a detail in perspective of the two members of the form of valve shown in Fig. 1, said members of the valve being illustrated as separated. Fig. 3 is a longitudinal sectional view showing a modification in which the form of valve illustrated in Figs. 1 and 2 is associated with a swelled form of holder or barrel. Fig. 4 is a similar view showing another form of valve combined with the swelled form of holder. Fig. 5 is a detail in perspective of the two members of the valve shown in Fig. 4. Fig. 6 is a longitudinal sectional view of a fountain-pen, showing the disk form of valve combined with a straight holder or barrel. Fig. 7 is a longitudinal sectional view showing a modification in which the operating member for the valve is exposed at the lower or pen-carrying end of the holder. Fig. 8 is a detail in perspective of the two members of the valve shown in Fig. 7, said members of the valve being illustrated as separated. Fig. 9 is a detail view, partly in section, of the axially-movable or rotary valve member shown in Figs. 7 and 8 and illustrating a modification

of the joint connection between such valve member and the pen-bearing section. Fig. 10 is a longitudinal sectional view, partly in perspective, showing a modification involving tubular valve and valve-seat members constituting the lower supplemental service-reservoir and valve-disk members for controlling communication between the two reservoirs.

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

As already explained, the present invention is utilized in connection with a holder or barrel having separate interior main supply and service ink reservoirs in addition to the usual ink-duct leading to the pen, and in this connection it may be observed that the lower or supplemental service-reservoir of the pen-holder is separate and distinct from the ink-duct with which fountain-pens are usually provided. Such ink-ducts have an independent function—namely, to assist in properly gaging the outward flow of ink to the pen and regulating, to some extent, the entrance of air to supply the space made by the ink being withdrawn from the reservoir adjacent to the duct. The provision of the ink-duct is usually accomplished by properly contracting the channel leading ink to the pen, whether this channel be in the nozzle, the pen-section itself, in the feeder lying under or above the pen, or in both. It will therefore be understood that the present invention, as well as the invention set forth in my aforesaid application, contemplates a structure in which the two reservoirs in the holder are entirely supplemental to or apart from the usual ink-duct, and the present invention relates specifically to the provision of a suitable valve, which is adapted to be fixedly positioned so as to constitute a separating-diaphragm between the two reservoirs and which shall also be provided with a member having its movement wholly confined within the plane within which the valve is arranged. This idea may be embodied in different modifications, to which particular reference will now be made.

The invention is applicable to different forms or shapes of holders; but in Fig. 1 of the drawings the numeral 1 designates a pen-holder or barrel straight through its length and constructed with a large interior main supply-reservoir 2, which occupies the greater portion of the holder and is of a maximum capacity, so as to contain a large supply of ink, which is held in reserve for use in replenishing the service-reservoir, hereinafter referred to. In this form of 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 3, carrying the pen 4 and feeder 5, as well as having the usual ink-duct 6; but it is not important to the successful carrying out of the invention what type of pen and feeder I employ nor special arrangement of these members. It is only necessary that there be associated with the holder having the duplex or double reservoirs suitable means for delivering the ink to the pen by capillary attraction. However, in addition to the ink-duct 6, irrespective of the position or formation of this duct, there is provided in addition to the main supply-reservoir 2 of the holder a supplemental service-reservoir 7, which is made as large as possible and is ordinarily of about as great capacity as the average-sized chamber or space within the ordinary-sized fountain-pens now on the market. The said supplemental service-reservoir 7 directly adjoins the ink-duct for the pen. In the form of the invention shown in Fig. 1 the said supplemental service-reservoir is preferably in the form of a tube 8, open at the end contiguous to the ink-duct and closed at its opposite end, as at 9. The said tube 8 lies longitudinally within the holder and is permanently fitted therein in a stationary position, preferably near the lower end thereof. The said tube 8 is also of a less width than the main supply-reservoir 2, into which it projects and forms the fixed valve-seat member of a valve designated in its entirety by the member 10, whereby this valve will constitute a separating-diaphragm between the two reservoirs 2 and 7. The fixed valve-seat member 8, which forms the service-reservoir 7, is provided therein, preferably in the side thereof, with a port 11, which when uncovered is in communication with the main supply-reservoir, whereby ink may pass to and from said reservoir through the port 11, and the covering and uncovering of the port 11 in the fixed valve-seat member 8 is accomplished through the medium of an axially-movable or rotary valve member 12. The movable valve member 12 is preferably in the form of a cylindrical cap telescoped over the fixed or stationary tube or member 8 and sufficiently loose thereon to permit of its turning or axial movement. The said valve member or cap 12 is preferably closed at the upper end thereof, as at 13, and is provided in its side with a valve-opening 14, which is adapted to aline and disaline with the port 11 in the stationary member or tube 8. The said valve member or cap 12 has suitably connected to one end thereof the inner end of an axially-movable valve-stem 15, the outer end of which stem is fitted to an adjusting-knob 16, having a threaded boss 17, turning in a threaded flange or socket 18, at the upper end of the holder or barrel 1. It will thus be seen that by simply turning the knob 16 in either direction the movable valve member or cap 12 is caused to turn upon the fixed valve member or tube 8 to provide for opening up or closing communication between the two reservoirs 2 and 7 at the will of the operator without the necessity of sliding the valve-stem in and out of the holder in the manner shown in my aforesaid pending application.

When it is desired to fill or replenish the

lower supplemental service-reservoir 7, the movable valve member or cap 12 is turned to bring the openings 14 and 11 into communication, thus permitting a supply of ink to run from the main reservoir 2 into the service-reservoir 7, and after sufficient ink has been supplied to the said reservoir 7 the movable valve member or cap 12 is turned to disaline the openings 14 and 11, thereby entirely cutting off the main supply of ink within the reservoir 2 from the main supply in the reservoir 7. When the pen is not in use, the valve may be manipulated to open up communication between the two reservoirs, so that by inverting the pen all of the ink in the lower or service reservoir 7 will drain back into the main reservoir 2, and may be held in the latter by again closing the valve, thus making it safe to carry the pen in any position.

In Fig. 1 of the drawings the form of valve described is shown applied to the holder 1 straight through its length; but the same form of valve can be used in connection with a holder having an intermediate annular enlargement or swelled portion 1^a, such form of holder being shown in my aforesaid application.

In those forms of the invention where the lower or supplemental service-reservoir is formed directly in the body of the holder or barrel itself a different type of valve may be employed, such as shown in Figs. 4, 5, and 6 of the drawings. In the said form of the invention the lower or supplemental service-reservoir is designated by the reference character 7^a, and the necessary separation between the said reservoir and the main supply-reservoir 2 is maintained through the medium of a valve 19, which valve is arranged in a fixed location between the two reservoirs. The said valve 19 essentially consists of a fixed valve-seat member 20, permanently fitted in a stationary position within the holder and the movable or rotary valve member 21 cooperating with the said fixed member 20. The said valve members 20 and 21 are in the form of flat circular disks arranged one upon the other and provided, respectively, with the posts 22 and 23, which are adapted to be alined and disalined by the axial or rotary movement of the movable member 21, and said movable valve member or disk 21 is fitted on the inner end of the axially-movable valve-stem 15, said inner end of the stem also extending through a bearing-opening 24 in the fixed valve-seat member 20 to provide for holding the disk or rotary member 20 in proper working relation to the said valve-seat member. By simply turning the rotary valve member 21 in either direction communication between the two reservoirs 2 and 7^a may be controlled in the same manner and for the same purpose as the herein-described form of valve shown in Figs. 1, 2, and 3 of the drawings.

In Fig. 4 of the drawings the disk valve 19 is shown applied to the swelled form of holder or barrel, while in Fig. 6 it is shown as applied for use in connection with the straight form of holder or barrel.

In the forms of the invention already described the operating member or device for the movable valve member consists of an axially-movable valve-stem 15, carrying an adjusting-knob exposed at the inner or upper end of the holder; but it will of course be understood that other means might be resorted to for adjusting or manipulating the adjustable or rotary valve member and such means controlled from either the upper or lower end of the holder. To illustrate the modifications that might be resorted to in this particular, there are shown in Figs. 7 to 10, inclusive, a novel and effective construction and arrangement of parts, whereby the valve or cut-off may be operated from the lower or front end of the holder, thus dispensing entirely with the use of the stem or rod running longitudinally through the holder, as shown in the other forms of the invention.

Referring to the modifications illustrated in Fig. 7 of the drawings, it will be seen that this modification involves the use of the same type of valve as shown in Figs. 1, 2, and 3 of the drawings, which type of valve includes tubular valve members registering one within the other and one of which is fixed and the other axially movable to provide for the alinement and disalinement of the ports thereof. In the modification, however, the tubular valve members are arranged somewhat differently, and by reference to Fig. 7 of the drawings it will be seen that the fixed valve-seat member 8^a is provided at the lower open end thereof with an interior-threaded collar 25, adapted to abut against the lower end of the holder 1 and contiguous to such collar with an exteriorly-threaded portion 26 engaging the interior threads 27 at the lower end of the holder to provide a connection for fixedly holding the valve-seat member 8^a in position within the holder, while at the same time permitting of the ready removal and replacing thereof whenever necessary. The said stationary or fixed valve-seat member 8^a, like the corresponding member 8 in the construction shown in Figs. 1, 2, and 3, is in the form of a tube open at its lower end and closed at its opposite end, as at 9^a, and extending inwardly within the holder and longitudinally thereof. The said tubular valve-seat member 8^a is also provided with a port 11^a, which when uncovered is in communication with the main supply-reservoir, whereby ink may pass to and from the said reservoir for the purpose and in the manner hereinbefore fully set forth; but in the modification shown in Fig. 7 the fixed tubular valve-seat member 8^a is adapted to have the axially-movable or rotary valve member 12^a working inside of the same instead of on the exterior thereof, as the corresponding valve member 12. (Shown in Figs. 1, 2, and 3.)

This of course is a mere inversion of the relation of the valve members from that already described and does not change the function or operation of the parts; but in order to secure the necessary manipulation or adjustment of the tubular movable valve member 12^a the latter carries a nozzle portion 28, which is arranged exterior to the holder 1 at the lower end thereof and confines the ink-duct 6^a, as well as being adapted to receive in the extreme outer end thereof the pen-bearing section 3, which may be fitted in the said nozzle either by means of a slip-joint, as shown in Fig. 7, or by a screw-joint 28^a, as shown in Fig. 9 of the drawings, either form of joint between the pen-bearing section and the nozzle 28 of the movable member permitting the said pen-bearing section to be readily removed for the purpose of changing the pen or to refill the holder with a fresh supply of ink when the supply of both reservoirs has become depleted. The axially-movable or rotary valve member 12^a is necessarily in the form of a tube and is provided in its side with a valve-opening 14^a, adapted to aline and disaline with the port 11^a in the tubular stationary valve-seat member 8^a, and at an intermediate point between its ends the said tubular valve member 12^a is provided with an exteriorly-threaded portion 29, adapted to engage within the exteriorly-threaded collar 25 to provide for holding the valve member 12^a in proper relation to the valve-seat member 8^a, while at the same time permitting of the necessary rotation of the said valve member 12^a to secure the alinement and disalinement of the opening 14^a with the port 11^a. It will be obvious that to turn the valve member 12^a it is only necessary to grasp the exterior nozzle portion 28 with the fingers, as such nozzle and the valve necessarily constitute a finger-grip.

In the construction described the tubular valve, consisting of the valve-seat and valve members 8^a and 12^a, forms the lower or supplemental service-reservoir, and therefore performs the same function in the same relation as the corresponding valve members shown in Figs. 1, 2, and 3, and another modification involving the manipulation of the valve from the lower end of the holder is shown in Fig. 10 of the drawings. The construction illustrated in this figure of the drawings is, in effect, a modification of that shown in Fig. 7 and simply involves a different disposition of the ports of the valve-seat and movable valve members. In this arrangement the fixed tubular valve-seat member 8^b is provided at its inner end within the holder with a valve-seat disk 30, provided therein with a segmental port 31, adapted to aline and disaline with a correspondingly-shaped port 32 in a valve-disk 33, carried at the inner end of the tubular rotary valve member 12^b, said disks 30 and 33 corresponding in operation to the similar disks shown in the modifications of Figs. 4, 5, and 6 of the drawings.

The modified constructions illustrated in Figs. 7 to 10, inclusive, while shown in connection with the swelled form of holder, could obviously be utilized with the straight form of holder without affecting the operation or result accomplished.

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

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

1. 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, and a valve occupying a fixed location between the two reservoirs, and adapted to hold an independent supply of ink in both reservoirs at the same time, said valve having a fixed and a rotatable member provided with ports adapted to be alined and disalined by the movement of said rotatable member, substantially as set forth.

2. In a fountain-pen, the holder provided with a main supply-reservoir, a supplemental service-reservoir tube having the filling portion thereof extending into the main supply-reservoir, and spaced from the walls of the latter, said supplemental service-reservoir tube being provided with a movable valve member, and means for operating said valve member to permit of the filling of the supplemental tube from the main reservoir and also to provide for cutting off communication between the two reservoirs when both are charged with ink.

3. 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, said supplemental reservoir being in the form of a stationary tube communicating at one end with the ink-duct and having its other end ported and extending into the main reservoir, there being a space between the ported end of the stationary tube and the walls of the main reservoir, and a tubular ported valve member registering with the said tube and arranged to cover and uncover the port thereof, substantially as set forth.

4. In a fountain-pen, a penholder provided with a main supply-reservoir, a tubular valve forming a supplemental service-reservoir in communication with the ink-duct, said valve consisting of fixed and axially-movable members arranged one within the other, and provided with ports adapted to aline and disaline, substantially as described.

5. In a fountain-pen, a penholder provided with a main supply-reservoir and a tubular

valve forming a supplemental service-reservoir in communication with the ink-duct leading to the pen, said valve consisting of a stationary valve-seat member fitted to the lower end of the holder and projecting inwardly therein, and a rotary or axially-movable member working within the fixed member and having an exterior nozzle portion carrying the pen-bearing section, substantially as described.

6. In a fountain-pen, a penholder provided with a main supply-reservoir, a tubular valve forming a supplemental service-reservoir communicating with the ink-duct, said valve consisting of a stationary valve-seat member detachably fitted to the lower end of the holder and projecting inwardly therein, and a rotary or axially-movable valve member working inside of the valve-seat member and provided with an exterior nozzle portion constituting a finger-grasp, and a pen-bearing section detachably fitted in the nozzle portion of the valve member, substantially as described.

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:

GEO. S. ROBBINS,

C. C. PEACOCK.