

(No Model.)

2 Sheets—Sheet 1.

W. W. STEWART.
FOUNTAIN PEN HOLDER.

No. 354,664.

Patented Dec. 21, 1886.

Fig. 2.

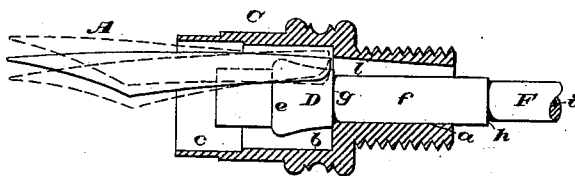


Fig. 1.

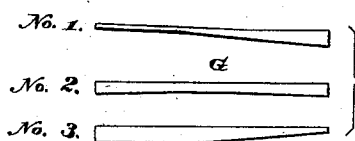
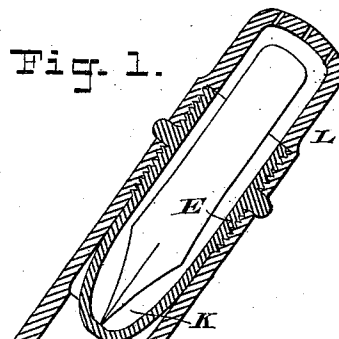


Fig. 3.

Fig. 4.

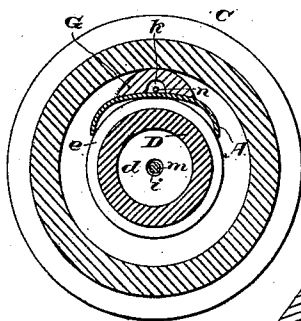


Fig. 5.

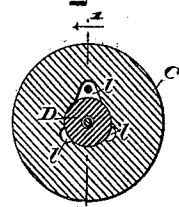


Fig. 6.

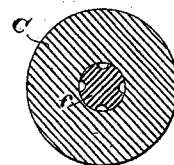


Fig. 7.

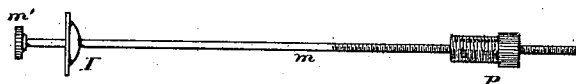
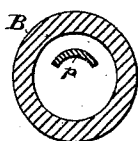


Fig. 8.



Fig. 9.



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Fig. 10.

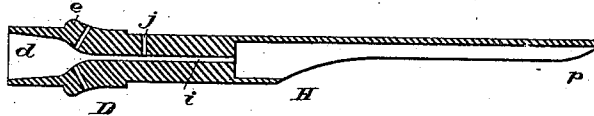


Fig. 11.

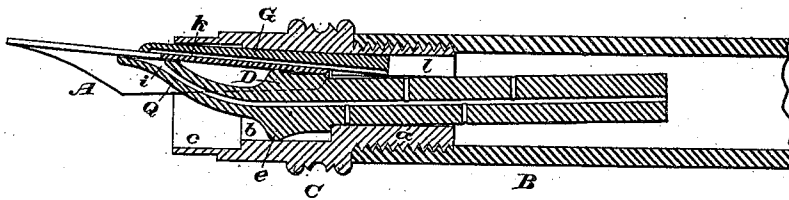


Fig. 12.

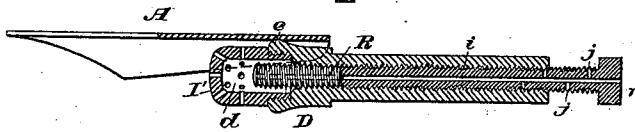


Fig. 13.

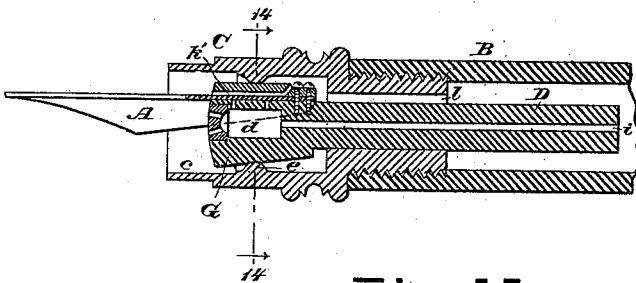


Fig. 14.

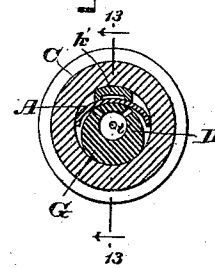
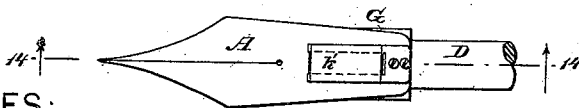


Fig. 15.



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UNITED STATES PATENT OFFICE.

WILLIAM W. STEWART, OF BROOKLYN, NEW YORK.

FOUNTAIN PEN-HOLDER.

SPECIFICATION forming part of Letters Patent No. 354,664, dated December 21, 1886.

Application filed January 22, 1886. Serial No. 189,383. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. STEWART, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Fountain Pen-Holders, of which the following is a specification.

This invention relates to fountain pen holders of that class wherein the tubular handle or reservoir is closed at its upper end, a duct or ducts being provided at the lower end for conducting ink down to the pen, and for admitting air into the holder.

My invention relates, principally, to the devices for securing and adjusting the pen and for controlling and regulating the flow of ink, and it includes several improvements in the construction of fountain-holders.

Figure 1 of the accompanying drawings is a longitudinal mid-section of a fountain pen-holder constructed according to my invention and in its most preferred form. Fig. 2 is a fragmentary view of the pen-mounting. Fig. 3 is an elevation of three different forms of "keys" for securing the pen. Fig. 4 is a transverse section on a larger scale, cut on the line 4 4 in Fig. 1. Fig. 5 is a transverse section on line 5 5 in Fig. 1. Fig. 6 is a similar view to Fig. 5, showing a slight modification. Fig. 7 shows the elements of an adjusting device detached. Fig. 8 is an elevation of a sleeve detached. Fig. 9 is a cross section on line 9 9 in Fig. 1; and Fig. 10 is a detached view showing a slight modification. The remaining views illustrate modified constructions, which will be described hereinafter.

Referring to Figs. 1 to 9, and more especially to Fig. 1, let A designate the pen (or "pen-nib"), which is preferably a gold pen; B, the tubular holder or reservoir, which is closed at its upper end; C, the tubular nozzle in which the pen is held, and D the bar or plug which passes through this nozzle into the reservoir. The holder or reservoir B is simply a tube with the nozzle C screwed into its lower end, and a plug, E, screwed into its upper end. The nozzle C has a contracted throat, *a*, in its upper portion, into which throat the bar D may fit. Beneath this throat it is enlarged to form a chamber, *b*, for holding the pen, and at its lower end it is further

enlarged at *c* to avoid contact with the pen, forming thereby the "tubular extension" claimed in my Patent No. 237,454, dated February 8, 1881, for preventing evaporation and protecting the fingers from being soiled. The bar D has a chamber, *d*, at its lower end, formed by a bell-mouth, an external flange or bead, *e*, a contracted neck, *f*, which preferably fits the throat *a*, and a shoulder, *g*, to limit the upward movement of the bar in the nozzle. The portion F is tubular and extends above the neck *f* into the cavity of the reservoir. A shoulder, *h*, is preferably formed by making the tube F somewhat smaller than the neck *f*. The tube F and bar D are preferably made in one piece, as shown, although this is not essential. A bore, *i*, forming a duct, extends through the bar D and tube F, from the upper end of the latter down to the chamber *d*. Several branch ducts or "vents," *j j*, lead into this duct *i*, affording passages for ink or air to flow through either from the duct *i* into the reservoir or from the reservoir into the duct.

The pen A is held between the flange *e* and the wall of the chamber *b*, a "key" or wedge, G, being inserted above it to make it tight. There is sufficient freedom of motion when the key is not in place to enable the pen to be tilted or rocked on the flange *e* as a fulcrum, as shown in Fig. 2. In this way the point may be elevated or depressed to suit the requirements of the individual writer who is to use the pen, and to adapt it to varying conditions as regards the flow of ink and the like.

The degree of elevation or depression of the point of the pen is determined by the form of the key used. Fig. 3 shows three different shapes of keys, No. 1 being to hold the pen in the position 1 in Fig. 2, No. 2 in the position 2 in that figure, and No. 3 in the position 3. The thickness of the wedge or key, or the force with which it is pressed in, is made also a means of adjusting the action of the pen. The key bears only on the top of the pen, as best shown in Fig. 4, and the pen being fulcrumed on the flange *e* the degree of pressure brought to bear upon it by the key has an important influence upon the action of the point of the pen. Thus if the pen be flattened by the key to a certain extent, its nibs will be

drawn somewhat apart, causing it to make a heavier mark. The degree of stiffness of the pen may be thus adjusted.

The key G may be applied in three ways.
 5 It may be placed on top of the pen, the pen and key inserted into the nozzle, and the bar D inserted afterward and pressed in until the requisite tension is obtained; or the bar may be inserted first, the pen next, and the key
 10 last, the key being pressed in from below; or the bar and pen may be inserted, and (the nozzle C being detached from the holder) the key may be pressed in from above. The shape of the key and the particular construction of
 15 the other parts will determine the method by which it should be inserted.

The key is provided with a duct or channel, *k*, extending through it, in order to afford a passage for ink to flow through down to the
 20 pen, or for air to pass through upward to the holder. This duct is preferably made by cutting a groove or channel in the under side of the key next the pen, as shown best in Fig. 4. The throat *a* of the nozzle has one or more
 25 grooves, *l*, cut in it to afford a continuation of the duct *k* with the holder. These grooves are shown in Fig. 5. As a substitute the grooves may be cut in the neck *f* of the bar D, as shown in Fig. 6.

30 In the preferred construction there are two ducts for feeding the pen, one being on top of the pen and the other beneath it. One of these may be feeding ink down to the pen while the other is conveying bubbles of air up into
 35 the holder. The duct extending down on top of the pen is composed of the channels *k* and *l*. The duct which extends down beneath the pen is composed of the bore *i* in the bar D and the chamber *d* at the lower end thereof. This
 40 chamber is closed by a cap, I, which comes close to the open lower end of the plug D, leaving, preferably, a narrow space between, as shown. Through this space the ink may flow out and climb by capillary attraction up
 45 to the outside of the bar D to the pen A, down which it may flow to the point; or the space between the end of the bar and the pen may become filled with fluid, which may thus flow directly to the pen. The inclosing of the
 50 bar in the tubular extension *c* prevents the evaporation of the ink from the outside of the bar, and enables the spaces around the bar to act as capillary reservoirs when occasion may require.

55 The chamber *d* is, in effect, the "condensing-chamber" found in several of my former patents, but placed somewhat lower down or nearer the pen-nib. Its function is to effect a union of the ink and air, the latter entering in the
 60 form of small bubbles, which become saturated with the fluid in this chamber and work their way thence up into the holder. The rate of flow of ink to the pen depends, to a considerable degree, on the capacity of this chamber
 65 and on the area of the exit-opening therefrom, both of which may be varied by moving the cap I toward or from the end of the bar D.

This is adjustable by means of a stem or wire, *m*, having a fine screw-thread, on which stem the cap I is fastened, and which may be screwed
 70 in or out by turning it. A small knob or handle, *m'*, is provided to turn it by. The screw may engage a female thread in the bar D or tube F, or, what is better, in a small plug, P, which is screwed into the upper end of the
 75 tube F. This plug P closes the upper end of the bore *i*, which can thus communicate with the interior of the holder only through the holes *j j*. The cap, stem, and plug P are shown detached in Fig. 7.

80 In order to keep the ink-duct *k l* on top of the pen clear and open, I prefer to arrange in it an "irritant," as I term it, (lettered *n*.) This is preferably a fine gold wire, but it may be a
 85 bristle or any other slender and flexible substance, preferably non-absorbent, which has the property of attracting to itself the water of the ink, thus keeping the duct always lubricated with a solvent of the solid constituents
 90 of the ink and preventing its being choked by the drying of ink in it.

To prevent the accumulation of large air-bubbles in the holder from interfering with the proper capillary flow of the fluid, I provide one or more capillary rings, J, one only
 95 of which is shown. This ring is preferably of hard rubber, with enough elasticity to permit of a slight compression. It is inserted in the tubular holder by pushing it in edgewise, leaving it in any desired position, where it re-
 100 mains held by friction. A large bubble may form within the ring thus arranged without acting as a stopper or plug to impede the flow of ink, as it otherwise would, since when a bubble is thus encircled by the ring the fluid
 105 may flow around the bubble upon the ring itself, which thus enables the fluid to get past the bubble gradually. These rings are particularly useful for holders using small pen-
 110 nibs, in order to reduce the tendency of the ink in the holder to flow down too rapidly. By using more or fewer of the rings J and placing them in different positions in the holder, the flow of ink may be retarded and
 115 adjusted as desired.

My longitudinally arranged rings J are to be distinguished from transverse diaphragms or ribs or other transversely-arranged devices for subdividing the reservoir or choking the flow.

I make no claim to a perforated partition
 120 arranged transversely in the reservoir, as shown in the Patent No. 221,815, dated November 18, 1879. Such a partition favors the stoppage of the flow by the accumulation of bubbles, instead of affording a capillary duct
 125 for enabling the fluid to pass around the bubble, as is the purpose of my ring J.

The tube F extends into the reservoir a considerable distance, and upon it is fitted a tubular adjustable sleeve, H, the upper end of
 130 which is cut away on one side, leaving the remaining side, *p*, to form what I will call a "tongue." This sleeve H is shown detached in Fig. 8. When in the holder, the tongue

p acts as a "capillary grip" for attracting a body of ink and retaining it in the space between itself and the adjacent inner wall of the holder. Fig. 9 shows this in cross-section. The space between the tongue *p* and the adjacent wall is narrow enough to hold the ink by capillary attraction, while on the opposite side of *p* the ink is subject to the action of gravity. The sleeve *H* may be turned on the tube *F* so that the tongue *p* may be brought to either side of the holder desired relatively to the pen *A*. If turned toward the upperside, as shown, the same as the pen *A*, the action of gravitation is contrary to the capillary action of the tongue, and the ink will flow more freely down to the pen than if the tongue were turned to the under side, as is denoted by dotted lines in Fig. 1, in which case the attraction of gravitation would co-operate with capillary attraction, and a greater mass of ink would tend to remain in the holder.

If the tongue be turned to either side, the action will be modified accordingly. Thus if the ink flows too freely or too scantily to suit the user of the pen, he need only unscrew the nozzle from the holder and adjust the sleeve *H* to regulate the flow to his liking. The adjustment may be further effected by sliding the sleeve out or in on the tube *F*.

The sleeve *H*, with its tongue *p*, may be made in one piece with the bar *D*, as shown in Fig. 10, so that by turning the bar the position of the tongue may be altered; but as this involves the disturbance of the fitting and adjustment of the pen *A*, I much prefer the separate construction first described.

The upper end of the holder, instead of being closed by a simple plug or screw-cap, as heretofore, is closed by means of a screw-plug, *E*, which is hollowed out to form a cup or receptacle, *K*, for holding an extra pen or pens, as shown. This cup is closed by a cap, *L*, which screws into or onto it. This cap forms on its exterior the bearing over which fits the usual cap, *K*, (shown in dotted lines in Fig. 1,) which protects the pen *A* when the holder is being carried in the pocket. The cap *L* is provided in its end with a series of perforations, as shown, to permit the air to circulate to and from the interior of the pen-receptacle, as it is found that if the latter be hermetically sealed the pens will corrode.

The holder is filled by unscrewing the nozzle *C*, dropping the ink into the inverted holder *B*, and then replacing the nozzle. If the holder is a new one it should not be used immediately, but should be left awhile for the ink to soak and soften it. When a new holder is first filled the action is imperfect, as the ink is apt to roll out in large drops; but when the hard rubber of which the holder is made has become well soaked the ink attaches itself to it, and thereafter obeys the capillary attraction of the surfaces in preference to the attraction of gravitation, being thereby fed to the pen in proportion to the demand for it.

I will now proceed to describe some modifi-

cations of my invention with reference to Figs. 11 to 15 of the drawings.

Fig. 11 is a longitudinal mid-section of the lower portion of the pen. Fig. 12 is a similar section of the bar *D* and pen-nib *A* removed, showing a different construction. Fig. 13 is a longitudinal mid-section of the lower part of a pen, showing a further modification. Fig. 14 is a transverse section of Fig. 13 on the line 14 14. Fig. 15 shows the pen-nib detached.

In the construction shown in Fig. 11 the bar *D* fits quite loosely in the neck of the nozzle *C*, so that when the pen *A* is wedged in place the rib *e* on the bar rests against the opposite wall of the nozzle. The channel *l* in the neck of the nozzle is large enough to admit the key *G* through it when the bar *D* is in place. The key is introduced from above or from the end of the nozzle, which enters the holder *B*. The pen *A* rests on the rib *e* as a fulcrum, so that it may be tilted up or down by the insertion of a key, *G*, having a greater or less taper. The bar *D*, below the rib *e*, is formed with a tubular neck, *Q*, which curves toward the pen *A*, and terminates with its open end against the under side thereof. Thus the bore or duct *i* is continued down to the pen instead of terminating in a condensing-chamber. The key *G* has a duct, *k*, formed through it in contact with the upper side of the pen, as already described.

Fig. 12 shows a modified construction of the bar *D* and condensing-chamber *d*. This chamber, instead of having an adjustable metal cap or disk, as before, is made with a rubber cap, *I'*, which is screwed to the end of the bar *D*. This cap is perforated with fine holes, which admit the passage of ink from the chamber *d* and the entrance of the air thereto. The flow is regulated by increasing or diminishing the capacity of the condensing-chamber. This is done by a plunger, *R*, which is movable longitudinally in the bar *D*, and the lower end of which projects more or less into the chamber. It is preferably screw-threaded, engaging a thread in the bore of the bar, and having a head, *r*, at its upper end by which to turn it. The duct *i* and lateral branches *j j* are formed in the plunger *R*.

Figs. 13, 14, and 15 show a construction that is well adapted to ladies' pens. The pen *A* has a grooved bar or duct, *k'*, fastened upon its upper side, preferably, by riveting, as shown, or in any other convenient manner. Under the pen is the bar *D G*, which passes through the throat of the nozzle into the holder. The lower portion of this bar is made of wedge shape on its lower side, as shown in Fig. 13, so that it acts as the equivalent of the wedge-shaped key *G* in the former constructions. The rib *e*, on which the pen *A* may be rocked as on a fulcrum, is here formed on the inside of the nozzle *C* instead of on the bar *D*. It thus bears downwardly on the grooved bar or duct *k'*, and thus compresses the pen.

The inclination of the pen will depend upon

the inclination of the upper face of the bar D G, of which there may be several different shapes, to adapt the pen for different writers. The duct *i* and chamber *d* are formed in the bar D G, as shown. The pen A, with its duct *k*, is first inserted in the nozzle, after which the particular bar D G which has been selected is pressed in, thereby forcing the pen upward and binding it fast. This construction is in great measure a reversal of my preferred construction, by which, however, the same or very similar effects are secured.

I claim as my invention—

1. A fountain pen-holder constructed with a nozzle and with a bearing for the pen, in combination with a key or wedge inserted in said nozzle and forcing the pen against said bearing, substantially as set forth.

2. In a fountain pen-holder, the mounting for the pen, consisting of the nozzle, a rib or flange on one side of the pen on which it may rock as on a fulcrum, and a locking-key entering the nozzle on the other side of the pen and wedging the latter fast, substantially as set forth.

3. In a fountain pen-holder, the mounting for the pen, consisting of the nozzle, a bar entering beneath the pen and having a rib or flange against which the pen rests and on which it may rock as on a fulcrum, and a locking-key of wedge shape entering above the pen and wedging the latter fast, substantially as set forth.

4. In a fountain pen-holder, the combination, with the nozzle and with the bearing therein for the pen, of a key or wedge entering the nozzle against the pen and serving to wedge the latter fast, and said key constructed with a duct formed through or along it for conducting ink from the reservoir to the pen, or admitting air into the reservoir, substantially as set forth.

5. In a fountain pen-holder, the combination of the nozzle, a bar beneath the pen against which the heel of the pen rests and of less convexity than the pen, and a wedge-shaped key entering the nozzle above the pen and adapted, when forcibly pressed in, to flatten the pen against said bar, thereby somewhat spreading the nibs, whereby, by means of said key and bar, the flexibility of the pen may be adjusted, as set forth.

6. In a fountain pen-holder, the combination of the nozzle, a bar fitting therein and having a rib against which the heel of the pen rests, a key entering the nozzle above the pen and wedging the pen fast, a groove, *k*, in the side of said key against the pen, forming a duct, and a groove, *l*, in the throat of the holder affording communication between the groove *k* and the reservoir, substantially as set forth.

7. A fountain pen-holder constructed with a nozzle for holding the pen and having two ducts for the passage of ink and air, the one

extending from the reservoir down along and in contact with the top of the pen, and the other extending from the reservoir down beneath the pen, substantially as set forth.

8. In a fountain pen-holder, the combination, with a nozzle inclosing and protecting the pen, of a bar arranged in contact with the heel of the pen and extending upward through the throat of the nozzle, a duct for ink and air extending through said bar, and a condensing-chamber at the lower end of said bar within the lower end of the nozzle, substantially as set forth.

9. A fountain pen-holder constructed with a duct for ink or air extending from the reservoir down to a point beneath the heel of the pen, a condensing-chamber communicating with said duct, a contracted outlet from said chamber, and an outer surface extending upward from said outlet into contact above the same with the under side of the pen, substantially as set forth.

10. In a fountain pen-holder, the combination, with the nozzle, of a bar, D, adapted to support the heel of the pen and having a condensing-chamber, *d*, at its lower end, a contracted outlet or outlets from said chamber beneath the point of contact of the bar with the pen, and a duct extending from said chamber up into the reservoir, and the means for controlling the discharge of ink from said chamber, substantially as described.

11. In a fountain pen-holder, the combination of a bar extending through the throat of the holder, a condensing-chamber in the lower end of said bar, a cap closing the lower end of said chamber, an adjusting device for moving said cap up or down to regulate the flow from said chamber, and a duct extending from said chamber up into the reservoir, substantially as set forth.

12. In a fountain pen-holder, the combination of bar D, formed with duct *i* and chamber *d*, cap I, arranged against the lower end of the bar to close said chamber, and screw *m*, for adjusting said cap toward or from said bar, substantially as set forth.

13. In a fountain pen-holder, the combination, with the reservoir, of a capillary ring, J, inserted therein in a plane longitudinally thereof, for the purpose specified.

14. In a fountain pen-holder, the combination, with the reservoir, of an elastic capillary ring, J, inserted therein edgewise under lateral compression and retained therein by friction, substantially as set forth, whereby it is prevented from assuming a transverse position and is adjustable to different points.

15. In a fountain pen-holder, a capillary adjusting device for controlling the flow, consisting of a tongue, *p*, arranged in the reservoir in capillary proximity to the wall thereof on one side and adjustable in position therein relatively to the position of the pen, substantially as and to the effect set forth.

16. In a fountain pen-holder, the combination, with a bar or tube entering the reservoir, of a tubular sleeve, H, mounted adjustably thereon and formed with a tongue, p, in capillary proximity to the wall of the reservoir, substantially as set forth.

In witness whereof I have hereunto signed

my name in the presence of two subscribing witnesses.

WILLIAM W. STEWART.

Witnesses:

ARTHUR C. FRASER,
GEORGE H. FRASER.