

W. W. STEWART.
Fountain-Pen.

No. 222,959.

Patented Dec. 23, 1879.

Fig. 1.

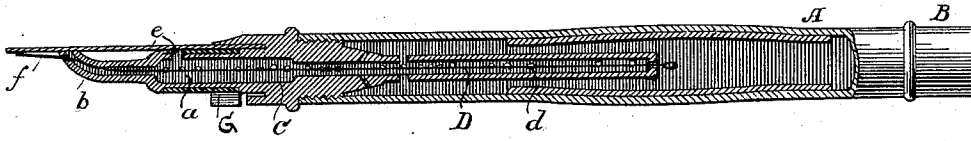


Fig. 2.

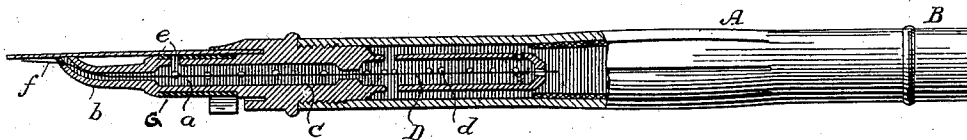


Fig. 3.

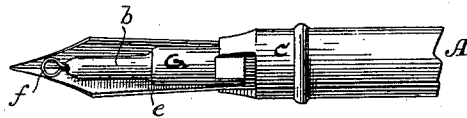
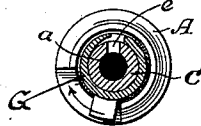


Fig. 4.



Attest:

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UNITED STATES PATENT OFFICE.

WILLIAM W. STEWART, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN FOUNTAIN-PENS.

Specification forming part of Letters Patent No. **222,959**, dated December 23, 1879; application filed June 11, 1879.

To all whom it may concern:

Be it known that I, WILLIAM W. STEWART, of Brooklyn, in the county of Kings, in the State of New York, have invented certain new and useful Improvements in Fountain-Pen Holders; and I do hereby declare that the following is a full and exact description thereof.

In fountain-pen holders the great desideratum is a regular discharge of ink in proper quantity, automatically controlled by the action of the pen during the process of writing.

Owing to well-known hydrostatic laws every drop of ink discharged must be simultaneously replaced by an equal volume of air, and if the ingress of air is prevented no discharge of ink can take place. Fountain-pen holders have, therefore, been commonly supplied with an air-valve at the upper end of the handle or reservoir, which valve is required to be opened before ink can be discharged from the pen.

It has been found practically difficult to produce the desired regularity of flow by this means because of the exceeding delicacy of the adjustment of said valve necessary to produce such regularity.

In my invention patented April 29, 1879, No. 214,795, the difficulty above alluded to is entirely corrected by the air-vent in the lower part of the reservoir, near to the discharge-opening, said opening being automatically and alternately opened and closed by the ink within the reservoir in exact accordance with the discharge of ink from the pen; but, owing to the viscosity of the ink, the air admitted will sometimes collect within the reservoir in bubbles of sufficient size to interrupt or impede the downward flow of ink; and my present improvement is designed to prevent such occasional impediment by preventing the coalescence of these little bubbles of air within the reservoir, or within the ink-chamber at the lower end of the reservoir. For this purpose I extend a fine wire, which may be cylindrical or of any other shape, through the ink-chamber and discharge-tube, and permit the external end of said wire to rest against the under side of the pen, near the nibs. Said external end I prefer to form in the shape of a loop or coil. When the bubbles of air enter they collect upon said wire separately, like little beads,

and are thereby conducted to the upper end of the ink-chamber and escape into the general reservoir within the handle, after which their presence cannot produce any disturbance in the ink-discharge. The protruding end of the fine wire resting upon the nibs of the pen is agitated by every movement of the pen, and the said agitation is communicated along the whole length of said wire, and has the double effect of facilitating the flow of ink along the discharge-passage and facilitating the movement of the little bubbles of air in the contrary direction to the upper end of the ink-chamber.

Having now set forth the principles of my invention, I will more particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a sectional perspective view of my pen. Fig. 2 shows a modification in the structure of the same. Fig. 3 is a plan, showing the protruding wire with loop. Fig. 4 is a transverse section through the cut-off.

A is the barrel or holder, the interior of which constitutes the reservoir for ink. B is a plug at the upper end of the same, which may be removed for the purpose of cleansing the interior or facilitating the filling of the same with a fresh charge of ink, but is not required to be removed at any other time. C is a plug inserted at the lower end of the reservoir A, containing a holder for the pen and an ink-chamber, *a*, and discharge-tubes *b*, for the delivery of ink upon the pen. *c* is the air vent or opening, through which air enters to supply the place of the ink which is discharged from the pen. D is a fine wire, of silver or some non-corrosive material, extending through said ink-chamber *a* into the discharge-passage *b*, and generally protruding therefrom and resting upon the pen, as above described. *d* represents little bubbles of air collected upon said wire, and moving along it toward the upper end of the ink-chamber, and there escaping into the general reservoir in the holder. At *f* the protruding end of said wire is shown as it rests upon the inner side of the pen, near the nibs.

In practice, no ink will escape from the opening *e*, except in the event of extraordinary

pressure, such as will sometimes take place from the expansion of the air within the holder A by the heat of the hand, &c., and when ink does so escape it fills the narrow space between the plug C and the pen around said opening *e*, where it is retained by capillary attraction, instead of running down the pen and escaping from the point thereof; and thereafter, as ink is discharged in the regular way from the discharge-tube *b*, said overflow of ink around the opening *e* will be gradually returned to the ink-chamber in lieu of air, until it has all reentered said chamber. There is, therefore, no possibility of the formation of blots by an undue discharge of ink, or any uncommon pressure upon the reservoir, either from the heat of the hand or otherwise. With this pen pressure upon the ink-holder is not necessary to produce a regular and uniform discharge of ink from the ink-chamber corresponding to the discharge from the pen to the paper.

A cut-off sleeve, G, is placed upon the lower end of the plug, C, so as to cover the vent *e*, and said cut-off is provided with an opening corresponding to the opening *e*, and registering therewith, so that when turned in one position the opening *e* is uncovered, and when turned to another position it will be wholly or partially covered, and by this means the size of said opening *e* is made variable, and the flow of ink is thereby controlled. The opening *e* being very small it is manifestly an operation of considerable delicacy to adjust the cut-off sleeve so as to vary the size of said opening, because of the small movement of said cut-off to affect said variation, and I therefore propose to undercut the opening through the cut-off sleeve, as shown in Fig. 4, whereby a much longer movement of said sleeve will be required to effect any desired change in the size of the opening *e* than would otherwise be the case.

Having described my invention, what I claim as new is—

1. A fountain-pen holder and interior or supplemental ink-chamber, the lower end thereof having a discharge-tube, *b*, and air-inlet *e*, combined with a wire extending through said ink-chamber into said discharge-tube for the purpose of collecting the bubbles of air as they enter, and conducting them without coalescence to the upper end of said chamber.

2. A fountain-pen holder having at its lower end a supplemental ink-chamber, with a discharge-tube, *b*, and air inlet *e*, combined with a wire extending from the upper part of said chamber through said discharge-tube at the lower part thereof, with its end protruding and resting upon the nib of the pen, as set forth, so as to be agitated by every movement of said pen in writing, for the purpose set forth.

3. A fountain-pen holder having at its lower end a supplemental ink-chamber, with a discharge-tube, *b*, and an air-inlet, *e*, combined with a regulating cut-off sleeve, G, whereby the size of the air-vent *e* may be varied, as set forth.

4. A fountain-pen holder having at its lower end a supplemental ink-chamber, with a discharge-tube, *b*, to deliver ink upon the nib of the pen, and an air inlet or vent, *e*, combined with a rotating sleeve, G, having an opening therein registering with the opening *e*, for the purpose of regulating the size of said opening *e*, in a manner set forth.

5. A supplemental ink-chamber, *a*, having a discharge-tube, *b*, and air-inlet *e*, combined with a wire, D, extending through said discharge-tube *b*, and having at its protruding end a coil or loop, *f*, to rest against the inner surface of the pen, as and for the purpose set forth.

WILLIAM W. STEWART.

Witnesses:

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FRED. B. WATSON.