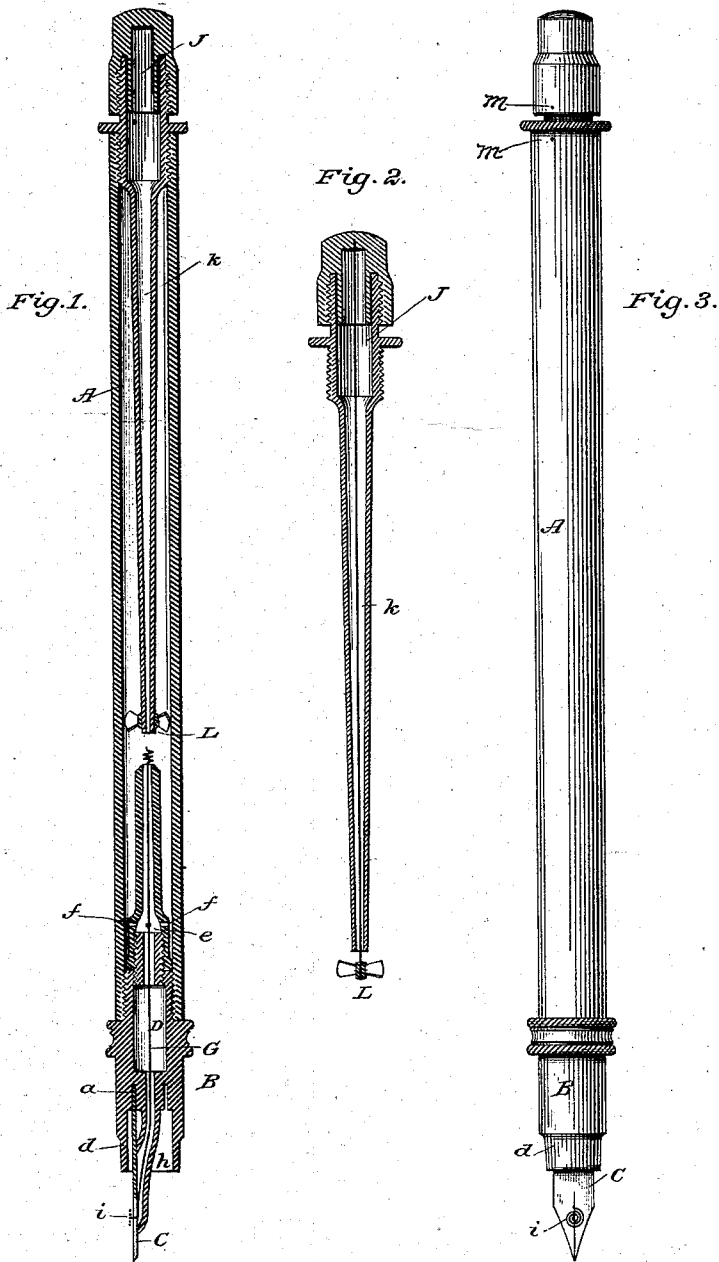


(No Model.)

W. W. STEWART.
Fountain Pen.

No. 237,454.

Patented Feb. 8, 1881.



Attest:

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UNITED STATES PATENT OFFICE.

WILLIAM W. STEWART, OF BROOKLYN, NEW YORK.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 237,454, dated February 8, 1881.

Application filed June 8, 1880. (No model.)

To all whom it may concern:

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

This invention relates to that class of fountain-pens for which Letters Patent have heretofore been granted to me, (see, for instance, Letters Patent No. 206,200, July 23, 1878, and No. 222,959, December 23, 1879;) and it consists, first, in an extension-tube within the reservoir as a receptacle for froth—*i. e.*, ink and air-bubbles; second, in the agitator within the reservoir to prevent the deposition of sediment; third, a capillary wire extending down through the ink-tube and through the pen, terminating in a little coil on the back of the pen; fourth, in a protecting-tube, whereby the pen is inclosed and protected, evaporation retarded, and the fingers guarded against soiling.

That others may fully understand my invention, I will particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a longitudinal section of my invention. Fig. 2 is a section of the air-tube detached. Fig. 3 is an exterior view of my pen complete.

A is the barrel or reservoir of my pen. At the lower end the barrel A is screwed upon a tip, B, which has at its outer end a seat, *a*, to receive the base of the pen C, and a jacket-tube, *d*, whereby the greater part of the pen is inclosed and hidden and the evaporation of the ink, which is exposed upon the pen, is retarded. The jacket *d* does not touch the pen C at any point.

Within the tip B there is an ink and air chamber, D, and an ink-tube, *h*, leads therefrom to the center of the pen, where it discharges ink as the same is required by the discharge from the pen upon the paper.

The upper end of the chamber D is partly closed by a hollow plug, *e*, the slender tubular end whereof extends up into the reservoir A, as shown.

Openings *f*, for the ingress of ink, are made in the sides of the plug *e*.

The capillary wire G extends from the up-

per end of the tubular plug *e*, where it may be secured by a coil of the wire outside of said tube, down through the chamber D and ink-tube *h*, and through an orifice in the pen C, and is retained there by being wound in a small flat spiral, *i*, which rests upon the back of the pen and retains a drop of ink there, always in readiness to run by gravity and capillary action down between the ribs of the pen whenever they are opened by pressure.

As explained in a former patent, the wire G, by capillary conduction, carries the incoming bubbles of air to the upper part of the chamber D, and finally to the upper part of the reservoir. In practice there will always be a few drops of ink at the bottom of the chamber D, and the upper part will be filled with froth or ink mixed with air-bubbles. It is desirable to have this inky air present in the tube, because ink, being a liquid cement, will precipitate and harden if exposed to dry air; but this inky air is already saturated with moisture, and therefore incapable of causing evaporation or precipitation.

When the holder is in the pocket the pen end should be turned uppermost, and the ink will fill the lower end of the chamber D, and the frothy ink will collect on top. The heat of the body will cause an expansion of the air, and will force the inky froth in the chamber D to overflow upon the pen. To prevent this I make the hollow head J with a long tubular extension, *k*, open at the extremity, so that the whole force of this expansion shall not be upward, but general. The air within the tube *k* and the head J will not only quickly yield to this pressure, but by convection it will rapidly take up the heat from the air in the reservoir, and in that way prevent the sudden expansion which is the cause of the expulsion of frothy ink above mentioned. The ink-reservoir is outside of this tubular extension *k*, and while the pen is reversed or head downward in the pocket the froth which collects upon the surface of the ink may work over and pass down into said hollow head.

Within the reservoir A, and in the vicinity of the point occupied by the extremity of the tubular extension *k*, there is an agitator, L, which may be employed to agitate the inclosed ink by revolving said agitator rapidly or by

shaking the holder with an endwise motion, and prevent the deposition of sediment. In these pens there is capillary attraction, variable with the weather. I do not know why it is, but the capillary tendency of inky fluids to adhere to and climb surfaces or between proximate surfaces is greater in damp and stormy weather than in fair, clear weather, and to overcome it the atmospheric pressure must be increased within the pen.

The capillary action referred to causes the ink to cling to the surfaces of the reservoir and resist a proper outflow upon the paper. This is due in some measure to the partial vacuum within the reservoir, and to relieve it the head J is turned a very little to the left, so as to break the perfect air-seal which otherwise was secured by packing the joint at the head. To regulate this adjustment two little coinciding marks, *m*, are made upon the head and the shoulder, against which it abuts when the head is screwed down tight, and when the capillary action is found to be too great the head is turned backward about one-tenth of an inch. When the weather is fine the head may be screwed down tight. When it is stormy it may be turned backward, as directed. The discharge upon the pen is so free, in order to admit air as fast as it is required, that no vent at the top is required, and a decided inlet for air at or near the head would destroy the action of the pen and allow the ink to be discharged too freely upon the pen. The agitator may be mounted upon a wire which extends through the tube *k*, and is secured in the head J, as shown in Fig. 2.

I am aware that it is not new to provide a reservoir pen-holder with an ink-tube at one end to deliver ink to the pen, and an agitator located within the body of said reservoir exterior to said ink-tube, and therefore I do not broadly claim such an agitator.

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

1. In a fountain pen-holder, the barrel A,

for a receptacle for ink, and a hollow head, J, provided with a long open tubular extension, *k*, penetrating said barrel to a point midway its length, or thereabout, as a receptacle for air and froth, combined with the ink-chamber D, having its inner opening in line with the opening into the tubular extension *k*, as set forth.

2. An expansion air-chamber, J, in the head of an ink-reservoir in a pen-holder, A, and a narrow tubular connection between said ink-reservoir and said hollow head, as set forth, combined with the ink-chamber D, having its mouth in close proximity to the mouth of said tubular extension *k*, and a capillary wire, G, to conduct the entering air-bubbles and discharge them near to the mouth of said tubular extension.

3. The reservoir-holder A, provided with the expansion-chamber J and tubular extension *k*, combined with the fan-shaped agitator L, mounted at or near the opening or mouth which leads into said chamber, for the purpose of agitating the froth and facilitating its entrance into said chamber, as set forth.

4. The reservoir A, provided with the expansion-chamber J and tubular extension *k*, combined with an agitator, L, mounted upon the end of the tube *k*, as set forth.

5. In combination with the ink-chamber D and feeding-tube *h* and pen C, the capillary wire G, extending through said chamber-tube, beneath the pen, and through the same, terminating in a little coil, *i*, at the back of the pen, for the purpose set forth.

6. In a fountain pen-holder, combined therewith and with the pen C, the tubular extension or jacket *d*, which, at a little distance, incloses, hides, and protects the pen and prevents evaporation of the ink, which is exposed upon the same, and protects the fingers from soil, as set forth.

WILLIAM W. STEWART.

Witnesses:

JULIUS RICKSECKER,
J. W. NEWBURGH.