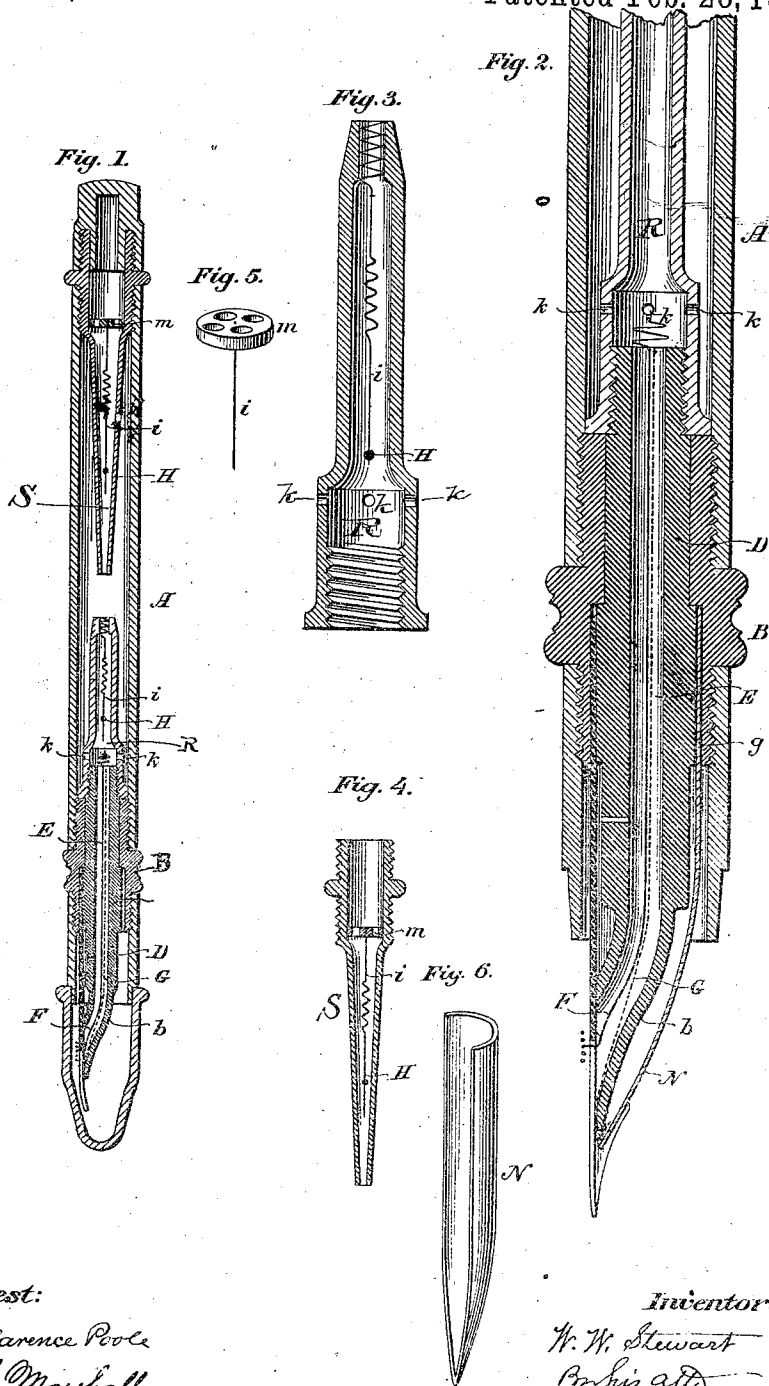


(No Model.)

W. W. STEWART.
RESERVOIR PEN HOLDER.

No. 254,175.

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UNITED STATES PATENT OFFICE.

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RESERVOIR PEN-HOLDER.

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To all whom it may concern:

Be it known that I, WILLIAM WASHINGTON STEWART, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Reservoir Pen-Holders; and I do hereby declare that the following is a full and accurate description of the same.

Ink is a liquid cement, and necessarily to a greater or less degree viscid. This viscosity, coupled with the fact that the sediments caused to be deposited by evaporation and oxidation will not redissolve in their own fluids, have been heretofore the obstacle to the successful use of reservoir pen-holders by the great mass of people who have frequent but not constant occasion for the use of such pens. The practical use of reservoir pen-holders also encounters another obstacle in the capillary attraction of the walls of the ink-chamber, whereby the flow and discharge of ink is impeded. The evaporation of the water in the ink and the deposition of sediment is in a measure prevented by the formation of froth or small bubbles of air and inky fluid in the reservoir or ink-chambers. This froth is wet or saturated air, and it is interposed between the ink-fluid and the comparatively dry air which fills those spaces in the holder which are not occupied by liquid. It is desirable to retain this froth in contact with the ink-fluid and interposed between it and the dry air above, and this has heretofore been done by separating the ink-reservoir into several compartments with narrow communicating passages, and the capillary attraction in the reservoir itself and in the ink-tube exterior to the reservoir have been neutralized by placing automatic agitators within such spaces.

It is necessary to adapt a fountain-pen to the variant usage of many different persons, and to a considerable extent to variations of the quality of the inks employed. I have therefore found that the pen is made more uniformly reliable by an agitator placed in the froth or air tube, and by a thread or strand of some permeable material placed lengthwise through the ink-chamber, so that the movement of bubbles of air upward through said chamber will cause a break in the continuity of the ink-current downward, because the permeable thread will

cause the fluid to cling and actually form in itself a duct from which the air will be excluded.

That others may more fully understand my invention and a practical mode of carrying it into practice, I will more particularly describe it, with reference to the accompanying drawings, wherein—

Figure 1 represents my invention in longitudinal central section. Fig. 2 is a similar section of the lower end enlarged. Figs. 3, 4, 5, and 6 are details detached.

A is the barrel or reservoir of my pen-holder, provided at its lower end with the point-section B and the ink-tube *b*. The point-section is provided with a tubular plug, D, which constitutes an ink-chamber, E, from which the immediate supply for the pen is discharged through the tube *b*. The capillary wire F passes upward from the pen through the tube *b* and the chamber E, and terminates in a little coil or other mode of fastening at the top or exterior of the plug D. The uses of this wire are well known, and do not require to be recounted here.

The walls of the chamber E and the wire F are impermeable to the ink, and therefore there is no more adhesion of the ink than always exists between a fluid and surface not actually oily or repellent; but the ink may be readily separated from the walls and the wire by the presence of air-bubbles, which will sometimes accumulate in such quantity that the flow of the ink will be impeded or actually prevented. To overcome this difficulty I stretch through the ink-chamber a strand or thread of some permeable fiber—such as twisted cord, woody strand of broom, or other suitable material—which, being saturated with ink, will afford a gripe for the same which cannot be broken by the presence of air-bubbles, because the continuity will extend into the fiber where the air will not penetrate. This strand is shown indicated in the drawings by the dotted line G; and even though the whole interior diameter of the chamber E should be occupied by an air-bubble, the cord G would constitute a continuous duct for the passage of ink through the bubble.

The discharge of ink upon the pen must be a continuous flow, and not spasmodic or intermittent, in order to produce satisfactory results,

and it is therefore important to preserve the small quantity of ink in the chamber E in a quiescent state. It is also important to preserve a portion of froth or inky bubbles of saturated air between it and the larger quantity in the main reservoir A, in order to prevent undue evaporation in said chamber, as well as to preserve an elastic air-cushion between said bodies of ink. The contracted passages *k*, communicating between said larger chamber or reservoir A and the smaller or froth chamber R, suffices to preserve this cushion of froth or inky bubbles; but when the ink is a little more viscid than it ought to be, or if, from any cause, there has been slight deposition of sediment, the bubbles may cling with such pertinacity and increase to such an extent as to effectually separate the ink in chamber R from that in chamber A. The ink in chamber E will then become expended, and the pen will cease to write, and will continue to refuse until the holder has been shaken with sufficient violence to break up the obstructing bubble and permit the ink to flow again.

25 An automatic agitator placed in the froth-tube is effectual in preventing the arrest and coalescence of the little air-bubbles, and the simplest form of such agitator is a small weight, H, at the free end of a delicate elastic stem, *i*. Said weight and stem may be of any metal or material which possesses the requisite elasticity, and is non-corrodible by the fluid of the ink.

35 The stem *i* may be secured or held in place in many ways. I represent two which are effectual and convenient—first, by forming the end of said stem in a coil in diameter somewhat larger than the diameter of the tube in which it is to be placed. When forced into this tube the expansion of the coil will hold it firmly in place. This mode is shown in Fig. 3. In Figs. 1, 4, and 5 the stem *i* is shown held in an orifice in a little perforated button or disk, *m*, which is fitted to said tube.

45 The froth-chamber S is common in pens of this class, and does not require description herein. I find it advantageous, however, to place an agitator, H, in this chamber as well as in chamber R, to prevent the formation of large bubbles.

When the holder is new and has been empty of ink for some time the walls become dry, and to a degree moisture-repellent. Under these circumstances the ink will not flow with regularity for a time, or until the walls and enclosed *d*, air have become thoroughly moistened. It will sometimes flow too freely, and again in insufficient quantity. To obviate the evil effect of this unequal flow when the pen is used infrequently, I make a jacket, N, preferably of gold—but other non-corrodible material will do—and place it outside of the ink-tube and beneath the pen, as shown in Fig. 2. This jacket may be constructed to fit the pen-groove *g*, and it serves to catch and hold the surplus or escaping ink which overflows from the tube and delivers it to the pen.

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

1. In a reservoir pen-holder, a pen and an ink-tube arranged to deliver ink on its concave side, combined with the ink-chamber of the same, and one or more threads of permeable fibrous material arranged lengthwise in said chamber beneath the pen, for the purpose set forth.
2. In a reservoir pen-holder provided with an ink-chamber at its lower end, and combined with the same, a capillary wire, F, and a fibrous permeable thread or strand, G, substantially as and for the purpose set forth.
3. A fountain pen holder provided with a pen and ink-tube, *b*, whereby the ink is delivered to said pen, combined with an exterior jacket, N, substantially as set forth.
4. The combination, in a reservoir pen-holder, of an ink-chamber, E, at the lower end of said holder, provided with a capillary wire, F, and permeable thread or strand G, inclosed in said chamber, and one or more froth-chambers above said ink-chamber, provided with automatic agitators within said froth-spaces, as and for the purpose set forth.

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Witnesses:
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