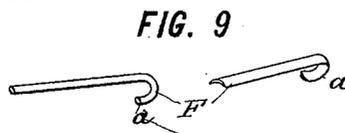
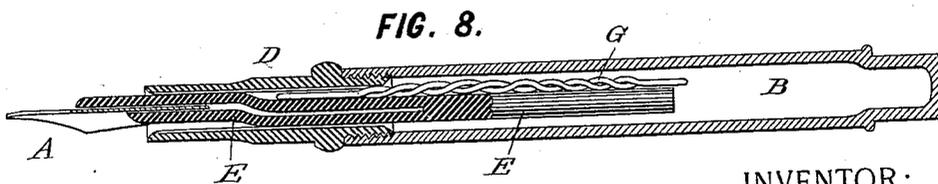
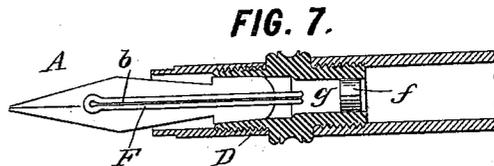
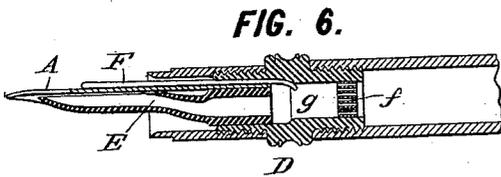
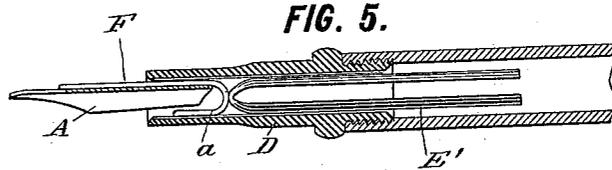
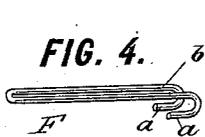
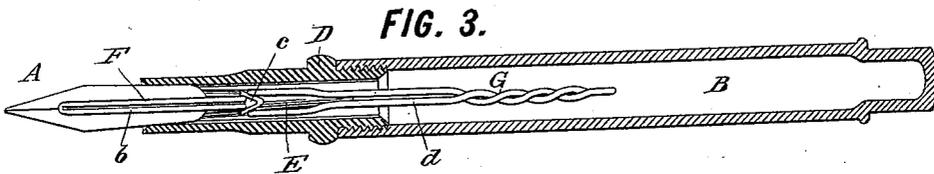
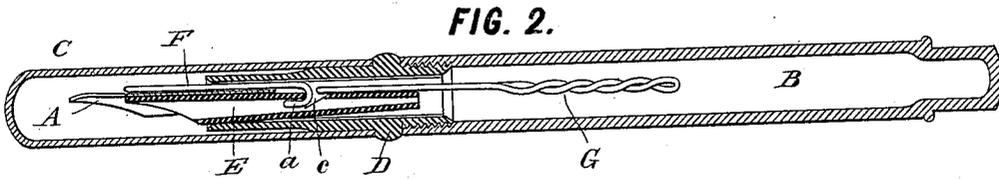
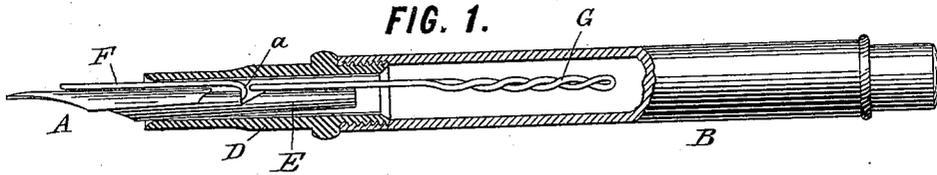


(Model.)

W. W. STEWART.
FOUNTAIN PEN.

No. 426,692.

Patented Apr. 29, 1890.



WITNESSES:

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C. H. Fraser

INVENTOR:

William W. Stewart,
By his Attorneys,
Arthur C. Brazer & Co.

(Model.)

2 Sheets—Sheet 2.

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FIG. 10.

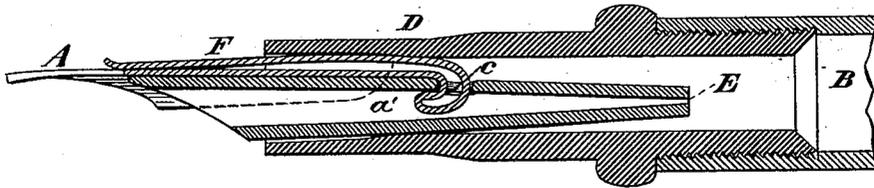
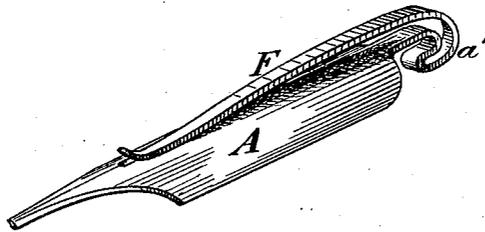


FIG. 11.



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UNITED STATES PATENT OFFICE.

WILLIAM W. STEWART, OF BROOKLYN, NEW YORK.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 426,692, dated April 29, 1890.

Application filed September 20, 1889. Serial No. 324,565. (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-Pens, of which the following is a specification.

This invention relates to fountain-pens, or pen-holders of that class wherein the ink is contained in a reservoir formed in the handle or holder of the pen, being sealed at its upper end, and the ink being conducted to the pen through a duct or passage, its space in the reservoir being taken by the air entering at the lower end of the holder through or adjacent to this duct. I have already secured numerous patents for fountain-pens of this character.

My present invention introduces certain improved constructions for facilitating and governing the flow of ink from the reservoir to the pen.

Figure 1 of the accompanying drawings is a side elevation, partly in longitudinal section, showing the preferred form of my invention. Fig. 2 is a longitudinal midsection thereof, the pen-protecting cap being shown in place. Fig. 3 is a longitudinal section through the holder and nozzle, the other portions being shown in plan. Fig. 4 is a perspective view of the key removed. Fig. 5 is a longitudinal section showing a modified construction. Fig. 6 is a longitudinal section of another modification; and Fig. 7 is a plan thereof, partly in longitudinal section. Fig. 8 is a longitudinal section showing another modification. Fig. 9 includes two perspective views of modified forms of the keys shown in Fig. 4. Figs. 10 and 11 are respectively an axial section and a perspective view of a modification.

Let A designate the pen or pen-nib; B, the reservoir-holder closed at its upper end; C in Fig. 2, the removable cap for protecting the pen when not in use; D, the nozzle or tubular plug which closes the end of the reservoir and within which the pen A is placed, and E the feed-bar plug or pipe which is arranged within this nozzle.

In the construction shown in Figs. 1, 2, and

3 the feed-bar E is made hollow and conical, with its smaller end turned upward or toward the reservoir. It is pressed tightly into the nozzle, and the pen A is forced in between it and the nozzle. On top of the pen is what I call a "key" F, which, in the preferred construction, consists of a piece of wire bent upon itself at its middle and having its two ends bent downwardly and forwardly beneath it to form hooks *a a*, as shown in Fig. 4. This key might, however, be made of a single wire bent at one end to form a hook *a*; but the two wires are preferable because of their greater width, thereby avoiding any rocking motion, and also because the space or slit between them forms a capillary duct or interstice *b*. The key might, however, be made of a strip of sheet metal stamped up with a slight curve or crown in order to form a capillary duct in the space between itself and the surface of the pen. These modifications of the key F are shown in Fig. 9. This key F is placed over the bar E and its hooked end *a* is hooked into an opening or notch *c* in the upper side of the bar before the latter is inserted in the nozzle. When thus inserted, the key is held firmly in place and prevented from falling out by its hook *a*. The pen may then be inserted by introducing it between the key and the bar. The key thus serves to fill or partly fill the space above the pen, which, as is well known, by reason of its approximately semi-elliptical cross-section, is out of contact with the nozzle at its top, although tightly wedged therein at its sides. The key also serves to confine the pen securely in place, and in addition it acts as a duct to carry the ink from the feed-tube down along the upper side of the pen. The interstice or capillary duct *b* of the key should extend down to the slit in the pen-nib, in order that the ink that is thus conducted down by the key may be carried to the pen-point through the slit. Above the key there is inserted between the foot-bar and nozzle the end of an irritant G, which is made of a piece of wire doubled upon itself and twisted. The upper end of this irritant projects up into the reservoir and is free to vibrate therein, while the lower end is wedged tightly between the

feed-bar and nozzle. This irritant serves to keep the ink in the reservoir in a fluid condition to prevent the formation of any sediment along the line of the flow of the ink to the key F. By reason of the irritant being made of two wires a capillary slit or interstice *d* is formed between them, which serves as an ink-duct. Thus a practically continuous duct is formed, extending from the twisted portion of the irritant in the reservoir down to the point of the pen.

The movement of ink and air is substantially the same as in certain of my previous pens, the air and ink moving reciprocally up and down through the ducts and spaces formed within the feed-bar E and between the feed-bar and nozzle. The ink is kept churned or subdivided into fine froth, the minute bubbles of which prevent too free or rapid flow of ink and afford just sufficient obstruction to the ascending movement of the air to maintain a very slight rarefaction in the holder, which also governs the downflow of ink. It results that the flow of ink to the pen is maintained uniform, and the ink is free from any tendency to run down in beads or tears to the point of the pen and drop off in blots upon the paper.

In the construction shown in Fig. 5 the feed-bar E is omitted, a bar E' being substituted for it and the irritant G. This bar E' is made of a strip of india-rubber, bamboo, or other suitable material preferably bent upon itself and inserted into the upper part of the nozzle, with its projecting ends extending up into the reservoir.

Figs. 6 and 7 show a key F, the rear end of which is bent downward beyond the heel of the pen, but is not hooked underneath. The feed-bar E is here made with a downward prolongation extending beneath the pen, as is common, and the upper end of the nozzle is closed by a scroll *f* of equally hard rubber or other suitable substance, which partly chokes the opening of the nozzle into the reservoir and forms between itself and the feed-bar E a smooth chamber *g*, which I call the "condensing-chamber," and which is normally filled with froth or foam of combined ink and air.

In Fig. 8 the feed-bar E is shown as prolonged upwardly into the reservoir, the twisted irritant G being extended along with it. The lower end of the feed-bar is split or slitted and the pen A is inserted in the slit thus formed.

The purpose of twisting the wire of which the irritant G is formed is chiefly to hold the two wires or the two parts of the doubled wire together; but it is also effective in that it provides a spiral and uninterrupted duct or interstice, constituting a continuation of the interstice *d*.

The key F, although preferably of wire, may be made of other materials—as hard rubber, celluloid, wood, bamboo, broom-corn, &c. The material of the irritant G may also be varied. By a suitable change in the size of

wire or strand of which these parts are made and in their material and in the closeness with which their two parts are pressed together (thereby making the ducts *b d* wider or narrower) the pen may be constructed to supply ink at any rate of flow that may be desired.

The key F may be formed integrally with the pen A, as shown in Figs. 10 and 11, wherein the pen is shown as constructed with an elongated tail or extension consisting of a narrow strip of metal projecting backward from the heel of the pen. This strip is bent down under the heel of the pen at *a'*, thus forming a hook, and is then doubled upon itself and extends up over and along the top of the pen toward the point thereof, thus forming the key F.

I claim as my invention the following defined novel features and combinations, substantially as hereinbefore specified, namely:

1. In a fountain-pen, the combination, with the nozzle thereof, of a key arranged over the top of the pen and extending within the nozzle into communication with the ink-reservoir, and constructed of a wire or strand bent on itself to form a capillary duct between its two parts, said key arranged with its bent portion above the pen and toward the point thereof.
 2. In a fountain-pen, the combination, with the nozzle thereof, of a key arranged on the top of the pen and extending within the nozzle into communication with the ink-reservoir, and constructed of a double wire or strand bent at its rear end into a hook turning downwardly and forwardly in a plane beneath the heel of the pen.
 3. In a fountain-pen, the combination, with the nozzle thereof and a feed-bar extending through the nozzle, communicating with the ink-reservoir and formed with an opening in its upper side back of the heel of the pen, of a key extending over the top of the pen and formed with its rear end hooked downwardly and entering said opening.
 4. In a fountain-pen, the combination, with the pen and a nozzle formed or provided with a feed-duct for conducting ink from the reservoir to the pen, of an irritant consisting of a double wire twisted on itself, fastened at one end into the nozzle and projecting at the other into the reservoir.
 5. In a fountain-pen, the combination, with the pen and a nozzle and feed-bar formed with a feed-duct for conducting ink from the reservoir to the pen, of an irritant consisting of a double wire twisted on itself, arranged over the feed-bar with its lower end fastened between the bar and nozzle and its upper end projecting into the reservoir.
- In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses..

WILLIAM W. STEWART.

Witnesses:
GEORGE H. FRASER,
FRED WHITE.