

No. 630,526.

Patented Aug. 8, 1899.

W. W. STEWART.
SELF FILLING FOUNTAIN PEN.

(Application filed Mar. 21, 1899.)

(No Model.)

2 Sheets—Sheet 1.

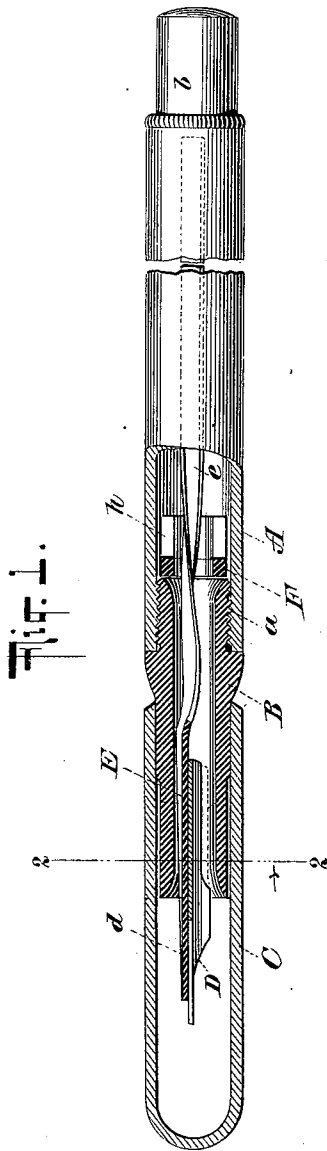


Fig. 1.

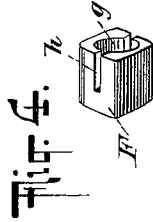


Fig. 4.

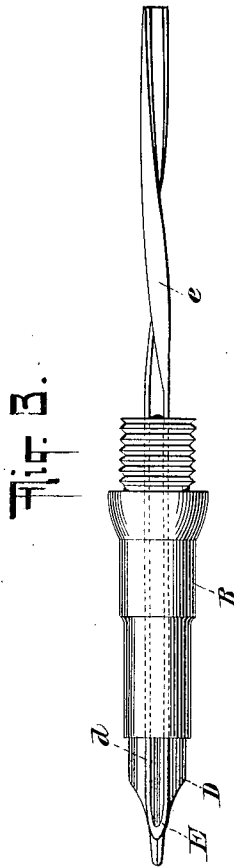


Fig. 3.

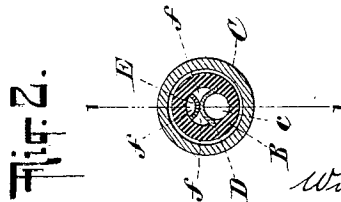


Fig. 2.

WITNESSES:
Subscribed and sworn to before me this 21st day of March 1899.
Charles C. Smith

INVENTOR
William W. Stewart

BY *Briesen & Knantz*

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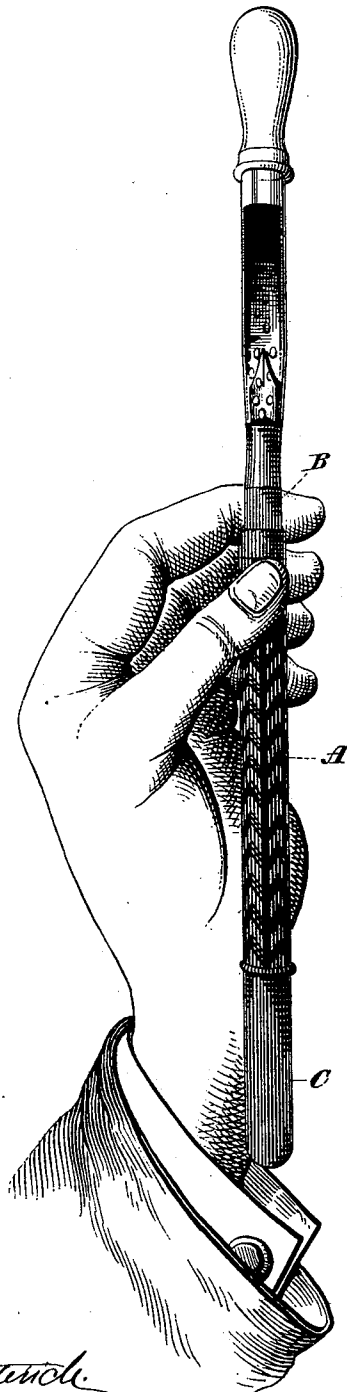


Fig. 5.

WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM W. STEWART, OF NEW YORK, N. Y.

SELF-FILLING FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 630,526, dated August 8, 1899.

Application filed March 21, 1899. Serial No. 709,890. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. STEWART, a citizen of the United States, residing in the city of New York, borough of Brooklyn, Kings county, State of New York, have invented certain new and useful Improvements in Self-Filling Fountain-Pens, of which the following is a full, clear, and exact description.

My invention relates to what I term "self-filling" fountain-pens, and the said invention is in the nature of an improvement upon the self-filling fountain-pens shown and described in my Patent No. 542,450, dated July 9, 1895.

The object of my present invention is to provide a clean, simple, and efficient fountain-pen which can be readily filled with the aid of different forms of "fillers" without removing or disconnecting any portion of the pen and which will at the same time be efficient under all conditions for writing purposes.

To these ends my invention consists in the novel arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings, wherein like characters indicate corresponding parts in the various views, Figure 1 is a side view, partly in section, of a fountain-pen embodying my invention. Fig. 2 is a transverse sectional view of the same on the line 2 2 of Fig. 1, looking in the direction of the arrow in said figure. Fig. 3 is a detached detail side view of the nozzle and the parts carried thereby. Fig. 4 is a detail perspective view of the controlling-plug to be hereinafter described. Fig. 5 is a view illustrating the manner in which the pen may be filled without removing the nozzle.

In the drawings, A represents the hollow handle, which constitutes a reservoir for the pen and which may be of the usual or any preferred construction. This handle A is provided with the usual nozzle B, which is adapted to be secured thereto, as indicated at *a*, or the handle and nozzle may be made integral. The usual cap or cover C is adapted to fit upon the nozzle, as indicated in Fig. 1, to cover the pen-nib, or when the pen is in use the cover may be placed upon the seat *b* at the end of the holder, as indicated in Fig. 5 of the drawings.

Upon reference to Figs. 1 and 2 of the drawings it will be seen that the nozzle B has a semicircular channel *c* cut therein, which ex-

tends adjacent to the bore and is in a sense auxiliary thereto. A pen-nib D is seated within the bore above the channel, so as to divide the bore and so that the curved portion of the pen will face the semicircular channel *c*, and the pen and the wall of the channel will form an unobstructed duct, which is substantially circular in cross-section, as represented in Fig. 2 of the drawings. Above the pen-nib is a meniscal-form opening, the walls of which are formed by the pen-nib and a part of the circular wall of the bore in the nozzle. Within this meniscal-form opening is contained a removable feeder-bar E, which in the present instance is illustrated as segmented in cross-section at *d*, where it contacts with the pen-nib, the trough-like portion thereof being uppermost, as indicated in Figs. 1 and 2 of the drawings, so that the bottom of the trough will rest upon the top of the pen. This feeder-bar is provided with a spiral projection or extension *e*, which projects back of the nozzle into the reservoir or handle A. By this arrangement it will be observed that a series of separate distinct passages or ducts *f*, irregular in cross-section, are provided above the pen-nib, whereas a single separate passage or duct, which is substantially circular in cross-section and which is relatively larger than the ducts *f*, is provided below the pen-nib for purposes to be hereinafter described.

Within the reservoir and directly in the rear of the nozzle B may be removably secured what I term a "controlling-plug" F, which is shown in detail in Fig. 4 of the drawings. This plug is preferably angular in form in cross-section when it is to be contained within a reservoir or conduit which is circular in cross-section, and the plug has a central passage, as indicated at *g*, through which a spiral end *e* of the feeder-bar E may project. The plug is likewise preferably provided with slots *h*, which extend from the rear thereof forward and partly through the plug for purposes which will hereinafter appear.

The natural tendency of bubbles is to form round, and if a circular opening is provided for their escape they will take this course and readily pass therethrough rather than pass through openings which are non-circular in outline, because the film comprising the bubbles will be seated against the terminal of the irregular or non-circular ducts and will

not readily pass therethrough. Then, again, the walls of the comparatively smaller irregular ducts f form capillary surfaces and nucleuses down which the ink will flow more readily than through the larger circular duct under the pen-nib. For these reasons it will be understood that when a column of ink is supported above the pen, as indicated in Fig. 5 of the drawings, the first and natural tendency of the ink will be to flow down through the ducts f , whereas the displaced air will readily flow out from the reservoir through the circular duct and will combine with the ink to form bubbles, which bubbles constitute upwardly-moving "stoppers," so to speak, which will prevent the ink from flowing through the channel in which they are contained. In this way it will be seen that a rapid movement of ink and air in opposite directions is established and no interference between the free movement of the two is presented. By my invention a fountain-pen can be filled with one hand, without removing the nozzle, in about six seconds, and the ink is not liable to run over or become smeared upon the fingers, as is ordinarily the case.

In order to fill the pen, it is merely necessary to support a column of ink above the pen-nib and the ducts of the pen, which are in open communication with the outer air, as indicated in Fig. 5 of the drawings. It is not necessary that any particular form of filler be employed, since any small tube or like instrument will answer the purpose. If, for instance, the ordinary form of filler with contracted nozzle be broken, the glass tube may be withdrawn and the broken end inserted in the rubber bulb and an excellent filler is provided for the pen. There is no necessity of compressing the bulb of the filler, as was the case heretofore, since the pen will absorb the ink from the filler in a natural manner, and there is no liability of the pen overflowing, because the pen when full will cease to receive more ink and the absorption will cease. The spiral portion e of the feeder-bar will give a gyratory motion to the ink when it comes into contact therewith and will readily conduct the ink below any film that may be retained at the controlling-plug F or at the rear of the nozzle B if the plug is not employed. By this means the ink is readily conducted to the closed end of the reservoir without interfering with the air which is displaced thereby and passes upwardly and out of the pen in the manner hereinbefore described.

The purpose of the plug F is to retain any film that forms at the rear of the nozzle and to prevent said film from obstructing the passages within the nozzle when the pen is being filled and at the same time to form a nucleus for the ready passage of ink and air around and through said film. Thus the film seats itself against the rear of the plug; but the corners of the plug contacting with the side walls of the reservoir will form nucleuses for the passage of ink around the film, while

the spaces between the side walls of the reservoir and those portions of the plug which do not contact therewith permit the air to pass around the plug. The spiral end of the feeder-bar passing through the central opening in the plug provides a centrally-located means for conducting the ink through the film. The slots h in the plug facilitate the feeding action of the ink and air in opposite directions, inasmuch as their use allows a limited movement of the film and a consequent movement of any ink and air that may be controlled thereby. The plug therefore has in practice a pumping-like action. When the plug is dispensed with, the film seats itself against the rear end of the nozzle, and the feeder-bar conducts the ink and air there-through in opposite directions. I have found that as the form of the channel under the pen-nib is changed from the circular in cross-section it correspondingly changes the flow of ink to the pen-nib, the quantity of flow being decreased as the form of the channel from the circular is increased.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a "self-filling" fountain-pen, the combination of an ink-reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, a pen-nib seated in the bore of said nozzle so as to divide the same into two ink and air inlet and outlet channels, the channel under the pen-nib being unobstructed and substantially circular in cross-section, while the channel above the pen-nib is of non-circular form in cross-section, whereby when a column of ink is supported above the open end of the pen, it will be absorbed by said pen.

2. In a "self-filling" fountain-pen, the combination of an ink-reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, a pen-nib seated in the bore of the said nozzle so as to divide the same into two ink and air inlet and outlet channels, the channel under the pen-nib being unobstructed and formed by the pen-nib on one side and by the wall of the bore of the nozzle on the other side and being substantially circular in cross-section, while the channel above the pen-nib is of non-circular form in cross-section and a feeder-bar situated in the channel above the pen-nib so as to divide it into a multiplicity of smaller channels whereby when a column of ink is supported above the open end of the pen, it will be absorbed by said pen.

3. In a "self-filling" fountain-pen, the combination of an ink-reservoir, a nozzle therefor which has a bore that communicates with the reservoir and is in open communication with the outer air at the lower end of the nozzle, an auxiliary substantially semicircular channel formed in the internal wall of said

nozzle, a pen-nib seated in the bore of said nozzle above said auxiliary channel so as to provide two ink and air inlet and outlet channels, the channel under the pen-nib being unobstructed and substantially circular in cross-section, while the channel above the pen-nib is of non-circular form in cross-section, whereby when a column of ink is supported above the open end of the pen, it will be absorbed by said pen.

4. In a "self-filling" fountain-pen, the combination of an ink-reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, an auxiliary substantially semicircular channel formed in the internal wall of said nozzle, a pen-nib seated in the bore of said nozzle above the auxiliary channel so as to provide two ink and air inlet and outlet channels, the channel under the pen-nib being unobstructed and formed by the pen-nib on one side and by the wall of the auxiliary channel on the other side and being substantially circular in cross-section, while the channel above the pen-nib is of non-circular form in cross-section and a feeder-bar situated in the channel above the pen-nib so as to divide it into a multiplicity of smaller channels, whereby when a column of ink is supported above the open end of the pen, it will be absorbed by said pen.

5. In a "self-filling" fountain-pen, the combination of an ink-reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, an auxiliary substantially semicircular channel formed in the internal wall of said nozzle, a pen-nib seated in the bore of said nozzle above said auxiliary channel so as to provide two ink and air inlet and outlet channels, the channel under the pen-nib being substantially circular in cross-section, while the channel above the pen-nib is of non-circular form in cross-section and a feeder-bar situated in the channel above the pen-nib so as to divide it into a multiplicity of smaller channels, said feeder-bar having a spiral extension which projects back into the reservoir.

6. In a "self-filling" fountain-pen, the combination of an ink-reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, an auxiliary substantially semicircular channel formed in the internal wall of said nozzle, a pen-nib seated in the bore of said nozzle above said auxiliary channel so as to provide two ink and air inlet and outlet channels, the channel under the pen-nib being unobstructed and substantially circular in cross-section, while the channel above the pen-nib is of non-circular form in cross-section, a feeder-bar situated in the channel above the pen-nib so as to divide it into a

multiplicity of smaller channels and a controlling-plug contained within the reservoir and through which the feeder-bar is adapted to project.

7. In a fountain-pen, the combination of a reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, a pen-nib seated in the bore of said nozzle so as to divide said bore into two ink and air inlet and outlet channels, a feeder-bar cooperating with the pen-nib and a controlling-plug contained within the reservoir and through which the feeder-bar projects.

8. In a fountain-pen, the combination of a reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, a pen-nib seated in the bore of said nozzle so as to divide said bore into two ink and air inlet and outlet channels, a feeder-bar cooperating with the pen-nib and provided with a spiral projection that extends into the reservoir and an angular controlling-plug contained within the reservoir and having a central passage therein through which the feeder-bar projects.

9. In a fountain-pen, the combination of a reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, a pen-nib seated in the bore of said nozzle so as to divide the said bore into two ink and air inlet and outlet channels, the channel under said pen-nib being substantially circular in cross-section, whereas the channel above it is of meniscus form in cross-section and a trough-like feeder-bar having its bottom bearing upon the upper side of the pen-nib and having a spiral projection which extends into the reservoir.

10. In a fountain-pen, the combination of a reservoir, a nozzle therefor which has a bore that communicates with the reservoir and which is in open communication with the outer air at the lower end of the nozzle, a pen-nib seated in the bore of said nozzle so as to divide the said bore into two ink and air inlet channels, the channel under said pen-nib being substantially circular in cross-section, whereas the channel above it is of meniscus form in cross-section, a trough-like feeder-bar having its bottom bearing upon the upper side of the pen-nib and having a spiral projection which extends into the reservoir and an angular controlling-plug having a central aperture which is adapted to receive the spiral end of the feeder-bar, said controlling-plug being removably contained within the reservoir.

WILLIAM W. STEWART.

Witnesses:

CHARLES E. SMITH,
MAURICE BLOCK.