No. 630,527. Patented Aug. 8, 1899.

W. W. STEWART.

SELF FILLING FOUNTAIN PEN.

(No Model.) (Application filed Mar. 21, 1899.)

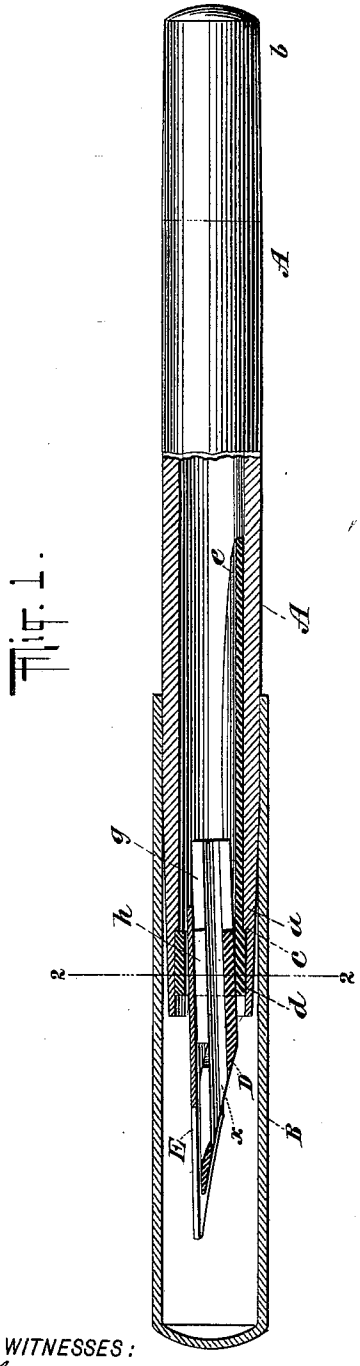

Fig. 1.

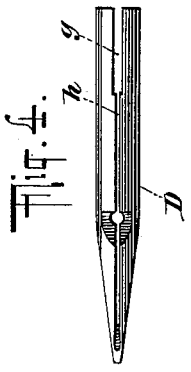

Fig. 4.

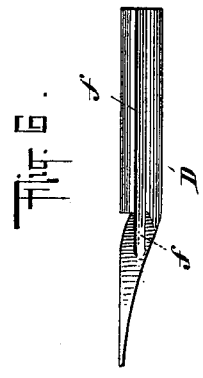

Fig. 6.

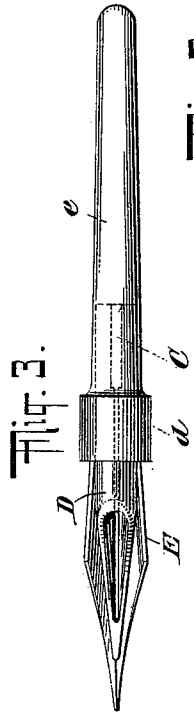

Fig. 3.

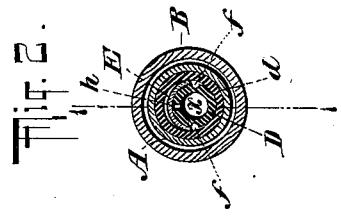

Fig. 2.

Fig. 5.

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

SELF-FILLING FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 630,527, dated August 8, 1899.

Application filed March 21, 1899. Serial No. 709,891. (No model.)

To all whom it may concern:

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

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-pen shown and described in my Patent No. 542,450, dated July 9, 1895.

The object of my present invention is to provide a simple and efficient fountain-pen which can be rapidly 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 represent corresponding parts in various views, Figure 1 is a side view, with parts broken away, of one form of fountain-pen embodying my invention. Fig. 2 is a transverse sectional view of the same on line 2 2 of Fig. 1. Fig. 3 is a detail side view of the pen-nib, feeder-bar, and the auxiliary feed, the view illustrating the manner in which the same are united for insertion in a holder. Figs. 4 and 6 are detail side views, taken at right angles to each other, of the feeder-bar. Fig. 5 is a detail side view of what I term a "controlling-bar," which will be hereinafter more fully described.

In the drawings, *a* represents a hollow handle, which constitutes the ink-reservoir of the pen and which may be of any desired construction. In the present instance I have illustrated the handle and nozzle thereof made integral and adapted to have the cap or cover B seated on the end *a* or *b*, accordingly as the pen is closed to be carried in the pocket or the pen-nib is uncovered for writing. Within the holder and near the lower open end thereof is a circumferential flange or abutment *c*, against which the collar *d* of the auxiliary feed device C is seated. From one side of this collar *d* projects an extension *e*, which is preferably of crescent shape in cross-section and extends back into the reservoir and adjacent to an internal wall thereof, as shown in Fig. 1 of the drawings. Within the collar *d* is seated an open-ended feeder-bar D, which is shown in detail in Figs. 4 and 6 of the drawings. This feeder-bar has a central bore extending therethrough which is preferably circular in cross-section, as indicated in Fig. 2 of the drawings. This feeder-bar D likewise has one or more grooves or channels *f* therein, which are preferably non-circular in cross-section and which extend to each side of the collar *d* when the feeder-bar is seated therein, so as to establish a communication for the passage of ink and air through said collar. The feeder-bar is likewise preferably slitted longitudinally throughout a portion of its length, as indicated at *g* in Fig. 4 of the drawings, for the purposes which will hereinafter appear. A slit *h* is provided, which extends from near the front end of the feeder-bar toward the rear thereof, and this slit communicates with the bore of the feeder-bar, so as to provide means for conveying ink from the reservoir to the slit in the pen-nib E, which pen-nib is seated on top of the feeder-bar and is retained in place by frictional contact between the collar *d* and the feeder-bar.

In Fig. 5 of the drawings I have represented a spiral controlling-bar F, which may be inserted and held friction-tight within the bore *x* of the feeder-bar to decrease the flow of ink to the pen-nib.

In filling the pen any suitable instrument may be employed which is capable of supporting a column of ink above the open end of the pen, and the ink will flow down through the ducts or channels *f*, and displaced air will flow out through the central bore *x* of the feeder-bar. The air flowing out through the bore will combine with the ink and form bubbles, which will prevent the ink from descending through this channel, so that the ink and air will flow in opposite directions, and the pen will rapidly fill itself without forcing the ink from the filler, as was customary heretofore. The pen naturally absorbs the ink in the manner described because of the fact that the natural tendency of the 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 the openings which are non-circular in outline, because the film comprising the bubbles will be seated against the terminals of the non-circular ducts or channels and will not readily pass therethrough. Then, again, the walls of the comparatively smaller non-circular ducts *f* form capillary surfaces and nucleuses down which the ink will flow more readily than through the larger circular bore of the feeder-bar. For these reasons it will be understood that when a column of ink is supported above the pen the first and natural tendency of the ink will be to flow down through the ducts *f*, whereas the displaced air will rapidly flow out from the reservoir through the circular duct or bore of the feeder-bar, and the air will combine with the ink to form bubbles, which constitute upwardly-moving "stoppers," so to speak, which will prevent ink from flowing through the channels 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.

The extension *e* of the auxiliary feeder projects through the film which naturally forms at the rear of the feeder-bar and establishes a nucleus for the free passage of ink and air around the film. The slits *g* in the feeder-bar permit a slight longitudinal movement of the film and a consequent movement of the ink and air controlled thereby, so as to facilitate the feeding action of the ink and air in opposite directions.

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

1. In a "self-filling" fountain-pen, the combination with a holder which constitutes an ink-reservoir, of an open-ended feeder-bar having a central bore which communicates with the reservoir and with the pen-nib, said feeder-bar likewise having conducting channels or grooves on the outer surface thereof which communicate with the reservoir and extend forward of the support for said feeder-bar.

2. In a "self-filling" fountain-pen, the combination with a holder which constitutes an ink-reservoir, of an open-ended feeder-bar having a central bore which communicates with the reservoir and with the pen-nib, said feeder-bar likewise having conducting channels or grooves on the outer surface thereof which communicate with the reservoir and extend forward of the support for said feeder-bar, and a spiral controlling-bar seated within the bore of said feeder-bar.

3. In a "self-filling" fountain-pen, the combination with a holder which constitutes an ink-reservoir, of a removable collar adapted to be seated in said holder, an open-ended feeder-bar seated in said collar and having a central bore which communicates with the reservoir and with the pen-nib, said feeder-bar likewise having conducting channels or grooves on the outer surface thereof which communicate with the reservoir and extend outside of the collar in which said feeder-bar is seated.

4. In a "self-filling" fountain-pen, the combination with a holder which constitutes an ink-reservoir, of an open-ended feeder-bar having a central bore which is substantially circular in cross-section and which communicates with the reservoir and with the pen-nib, said feeder-bar likewise having conducting channels or grooves which are non-circular in cross-section on the outer surface thereof and which communicate with the reservoir and extend outside of the support for said feeder-bar.

5. In a "self-filling" fountain-pen, the combination with a holder which constitutes an ink-reservoir, of a removable collar adapted to be seated in said holder, an auxiliary feeder extension projecting from said collar back into the reservoir, an open-ended feeder-bar seated in said collar and having a central bore which communicates with the reservoir and with the pen-nib, said feeder-bar likewise having conducting channels or grooves on the surface thereof which communicate with the reservoir and extend forward of the collar in which said feeder-bar is seated.

6. In a "self-filling" fountain-pen, the combination with a holder which constitutes an ink-reservoir, of a removable collar adapted to be seated in said holder, an auxiliary feeder extension projecting from said collar back into the reservoir, an open-ended feeder-bar seated in said collar and having a central bore which is substantially circular in cross-section and which communicates with the reservoir and with the pen-nib, said feeder-bar likewise having conducting channels or grooves which are non-circular in cross-section on the outer surface thereof and which communicate with the reservoir and extend forward of the collar in which said feeder-bar is seated.

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