

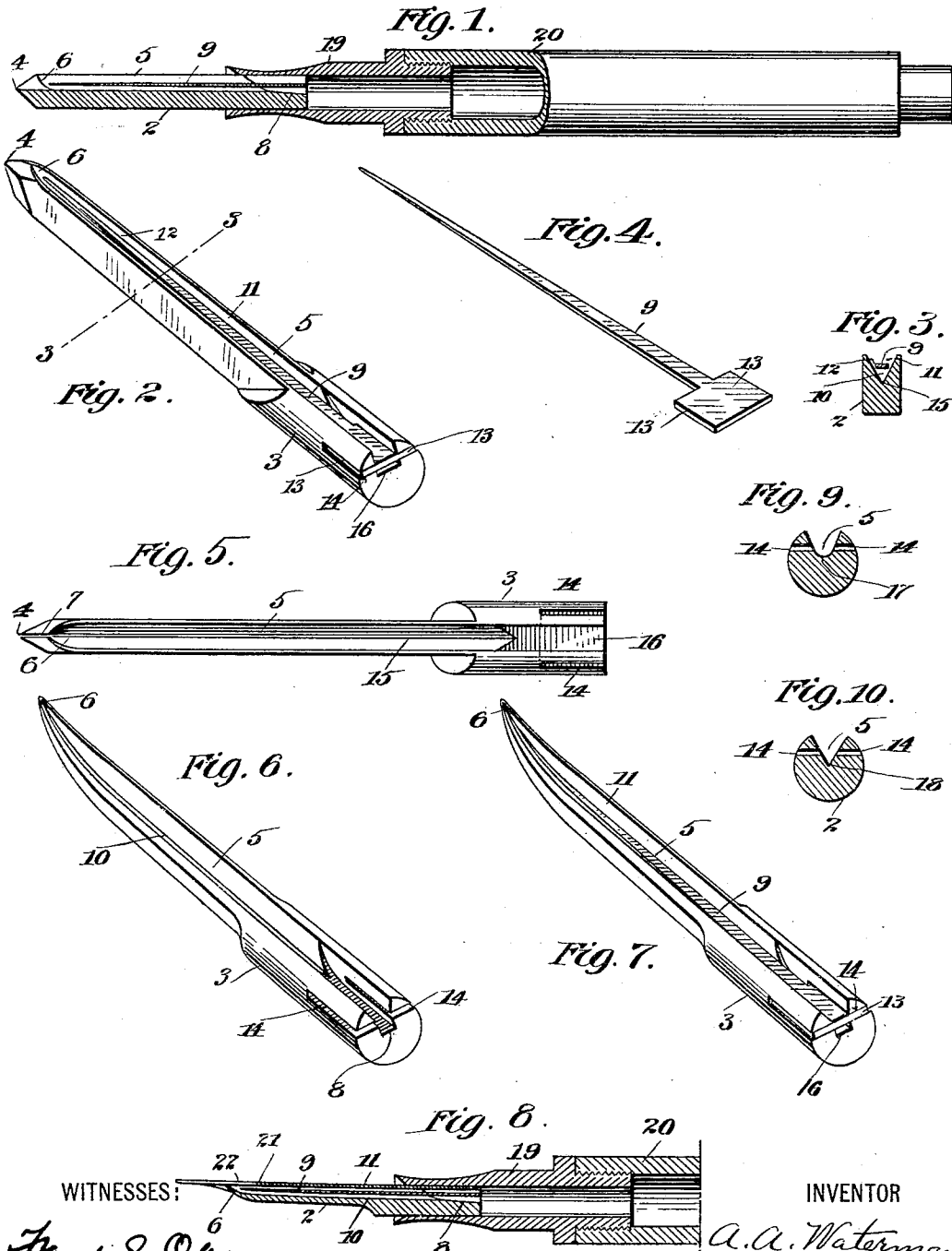
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A. A. WATERMAN.
FOUNTAIN PEN.

(Application filed Aug. 16, 1899.)

(No Model.)



WITNESSES:

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FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 638,779, dated December 12, 1899.

Application filed August 16, 1899. Serial No. 727,347. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR A. WATERMAN, a citizen of the United States, residing in Boston, county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Fountain-Pens, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to writing-pens having a reservoir or fountain for supplying the writing-point thereof with ink; and the principal object of my invention is to provide a fountain or reservoir pen with means for keeping the ink-duct moist and in which the ink always stands ready to flow from the writing-point, so that when starting to write with the pen after it has remained unused for a time the ink immediately flows from the writing-point practically without retardation.

To these ends my invention consists in the various novel and peculiar arrangements and combinations of the several parts of the device, all as hereinafter fully described, and then pointed out in the claims.

I have illustrated types of my invention in the accompanying drawings, wherein—

Figure 1 is a view of my improved fountain-pen, shown with the upper part of the reservoir-barrel in side elevation, while the remaining parts of the pen are shown in longitudinal vertical section. Fig. 2 is an enlarged perspective view of the ink-feeder of the construction shown in Fig. 1. Fig. 3 is a cross-section on line 3 3, Fig. 2. Fig. 4 is a perspective view of the detached reed which forms part of the ink-feeder. Fig. 5 is a plan view of the ink-feeder shown in Figs. 1 and 2, but with the reed omitted to show clearly the formation of the groove in the feeder. Figs. 6 and 7 are perspective views of a modified form of the ink-feeder, showing the same without the reed and with the reed, respectively. This form of ink-feeder is adapted to be used with an ordinary metallic writing-pen. Fig. 8 is a central longitudinal sectional view, on a reduced scale, of the fountain-pen in which is used the form of ink-feeder shown in Figs. 6 and 7, together with an ordinary metallic

writing-pen, the main portion of the reservoir barrel or holder being omitted. Figs. 9 and 10 are cross-sections of modified forms of the ink-feeder, in the former of which the longitudinal groove has a rounded bottom and in the latter of which the longitudinal groove has a V-shaped bottom throughout its length.

Referring to the drawings, in which like numbers of reference indicate like parts throughout, 2 is a bar made of suitable material—such, for example, as hard rubber—the inner end 3 of which is made preferably cylindrical to fit within a suitable holder, while the outer end of the bar is cut away on its exterior or reduced to make it more shapely. The extreme end of the bar is pointed, so as to provide at 4 what I term a “writing-point.” The upper side of the bar is provided with a longitudinal groove 5 of practically uniform width and extending from the inner end of the bar to, or near to, the outer end of the bar, where it contracts and terminates at 6. Between the outer end 6 of the groove 5 and the writing-point 4 there is a channel or slit 7, which connects these two parts, so that the ink may be drawn from the outer end of the groove 5 through the channel to the writing-point 4. This channel 7 is made in the form of a fine capillary slit, as will be understood from Figs. 1, 2, and 5. The bottom of the groove 5 at its inner end slopes downwardly toward such end, as indicated at 8.

Within the groove 5 I suspend a thin reed 9, which may be made of any suitable material—such, for instance, as hard rubber. This reed is preferably made flat and tapers toward its outer end to a point. It is arranged longitudinally within the groove, so as to extend practically throughout the length thereof and lies near the bottom and side walls of the groove, so as to provide a comparatively narrow capillary subchamber 10 beneath the reed, and also the ink-supply duct 11 above the reed, which duct is of comparatively large cross-sectional area.

Between the edges and end of the reed 9 and the walls of the groove 5 there is a thin capillary passage 12, through which the ink is drawn from the subchamber beneath the reed, so as to moisten the walls of the duct 11 and also the upper surface of the reed 9 when such subchamber is filled with ink.

The reed 9 is mounted in fixed position by forming the same with the lateral projections 13, which are inserted by sliding movement into the slots or recesses 14, formed horizontally in the inner end of the bar 2. The reed may thus be mounted and dismounted by sliding it longitudinally in or out of the inner end of the groove in the bar, the lateral extensions 13 fitting sufficiently snug in the slots 14 to hold the reed in place.

The outer and main part of the groove 5 has the bottom thereof formed V-shaped in cross-section, as indicated at 15, while the bottom of the groove at its inner end is formed flat, as shown at 16, and this flat part slopes downwardly at 8 to the inner end of the bar. (See Figs. 1, 6, and 8.) There is thus provided beneath the reed 9 a capillary subchamber the cross-section of the main part of which is triangular in shape, while the shape of the inner end thereof is rectangular in cross-section, and it increases in its cross-sectional area toward the inner end by reason of the sloping bottom thereof. This formation of the bottom of the subchamber is the preferred form, though, if desired, the bottom of this chamber may be rounded throughout its length, as at 17 in Fig. 9, or it may be formed V-shaped, as at 18, Fig. 10.

From the foregoing description it will be understood that when, as shown in Fig. 8, an ordinary fountain-penholder having a cylindrical reservoir-barrel 20, closed at its upper end against the admission of air, is fitted with a nozzle 19, into which the inner end 3 of my feed-bar is inserted, has been filled with ink and the whole pen is put into the writing position—*i. e.*, with the pen-point down—the ink in the reservoir is first induced to run into the feed-bar by the peculiar formation of the duct 11, with its reed 9 and the subchamber 10. The ink being thus drawn into the capillary subchamber 10 and filling the same is drawn up around the edges of the reed 9 and the end thereof through the narrow capillary passage 12, so that it moistens the walls of the ink-supply duct 11 above the reed 9 and also moistens the upper surface of the duct 11. This moistening of the walls of the duct 11 is thereby maintained while the pen is not in use, so that whenever the point of the slit metallic writing-pen 21 is applied to and moved over the paper a supply of ink for free writing flows along the duct 11 by the action of gravity. When thus used in connection with the ordinary split-nib pen, the ink is taken from the lower part of the duct 11 through the slit 22 of the pen of the writing-point, and this flow is practically instantaneous and kept up throughout the use of the pen. As a vacuum in the reservoir is prevented by the admission of air through the hole in the nibbed pen, such supply of air passes upward in the form of bubbles through the duct 11.

When the pen is laid aside, the bulk of ink leaves the supply-duct 11; but the capillary

subchamber 10 retains the ink, likewise the capillary passage 12, which skirts the reed 9, so that the walls of the supply-duct 11 will thereby continually be kept moistened with ink. In thus maintaining the walls of the ink-supply duct moist with ink while the pen is not in use I provide a very desirable construction, as the pen may be written with immediately upon taking it up after it has been laid aside for some time out of use.

In use after the duct 11 is filled with ink the amount of ink spread on the paper by the writing-point varies with the fineness or coarseness of the writing-point, and it is further affected by the degree of separation of the split nibs, whether they are flexible, as when metal-nibbed pens are used, as already described, or whether the nibs are unyielding, as when the writing-points are but a part of the feed-bar itself, as in Fig. 1, which feed-bar, having a capillary slit 7 in its point, is used without an additional nibbed writing-point for the purpose of ruling lines as well as for writing. In thus using the device the capillary slit 7 is held uppermost in drawing a fine line. To increase the width of the line, the bar is turned so as bring the capillary slit 7 on the under side, and by varying the angle of the edge of the slit 7 with the paper the line may be varied in width. By placing the edge of the slit 7 in contact with the paper and moving the bar laterally across the same a very broad line will be produced. The device may thus be used, further, as a ruling or lining pen, even when not used with a reservoir, by dipping it in the ink, when it will take up and retain a quantity of ink sufficiently large to do considerable drawing without redipping in the ink.

The bar 2 being inserted in a suitable holder it projects therefrom a suitable distance, and in using it with a ruler to make lines the lower end of the holder may be kept in contact with the edge of the ruler, thereby preventing the liability of inking the ruler.

When using the feed-bar without a metallic-nibbed pen covering the duct 11, the bar is usually inserted into the nozzle 19 a little farther, so that the duct 11 filled with ink will not be exposed to and affected by the air for so great a distance. In this case the air-bubbles that pass into the reservoir to prevent a vacuum then enter at the edge of the nozzle 19, and consequently have less distance to travel in the duct 11 than when they enter the duct farther down through a hole in the metallic-nibbed pen.

I wish to be understood as not limiting my invention to the particular construction of the various parts of my improved pen herein set forth, as the same may be variously modified without departing from the spirit of the invention.

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

1. An ink-feeder for a pen the same consist-

ing in a bar provided with a longitudinal groove extending along one side thereof, a divisional reed disposed longitudinally in said groove near the walls thereof and dividing the same into a comparatively narrow capillary subchamber beneath said reed and an ink-supply duct above said reed of a comparatively large cross-sectional area, and a capillary passage extending along the side of said reed and connecting said subchamber with the said ink-supply duct, whereby said ink-supply duct is constantly maintained moist while the pen is not in use for quickly starting the flow of ink in said ink-supply duct when the pen is used, substantially as and for the purpose set forth.

2. An ink-feeder for a pen the same consisting in a bar provided with a longitudinal groove extending along one side thereof, a divisional reed disposed longitudinally in said groove near the walls thereof and dividing the same into a comparatively narrow capillary subchamber beneath said reed and an ink-supply duct above said reed of a comparatively large cross-sectional area, said reed being suspended by one end while the other end remains free, and a capillary passage extending along each side of said reed and connecting said subchamber and the said ink-supply duct, whereby said ink-supply duct is constantly maintained moist while the pen is not in use for quickly starting the flow of ink in said ink-supply duct when the pen is used, substantially as and for the purpose set forth.

3. An ink-feeder for a pen the same consisting in a bar provided with a longitudinal groove extending along one side thereof, a divisional reed disposed longitudinally in said groove near the walls thereof and dividing the same into a comparatively narrow capillary subchamber beneath said reed and an ink-supply duct above said reed of a comparatively large cross-sectional area, the said reed being provided at or near its inner end with oppositely-extending lateral projections, slits or cavities formed in the walls of said groove at or near the inner end thereof for receiving the said lateral projections on the reed to sustain the reed in place, and a capillary passage extending along each side of said reed and connecting said subchamber and the said ink-supply duct, whereby said ink-supply duct is constantly maintained moist while the pen is not in use for quickly starting the flow of ink in said ink-supply

duct when the pen is used, substantially as and for the purpose set forth.

4. An ink-feeder for a pen the same consisting in a bar provided with a longitudinal groove extending along one side thereof, the bottom of said groove toward its outer end being formed V-shaped in cross-section while the bottom thereof at the inner end is formed flat, a divisional reed placed longitudinally in said groove near the bottom thereof and suspended therein by its inner end and dividing said groove into a comparatively narrow capillary subchamber beneath said reed and an ink-supply duct above said reed of a comparatively large cross-sectional area, and a capillary passage at each side of said reed connecting said subchamber and the said ink-supply duct, whereby said ink-supply duct is constantly maintained moist while the pen is not in use for quickly starting the flow of ink in said ink-supply duct when the pen is used, substantially as and for the purpose set forth.

5. An ink-feeder for a pen the same consisting in a bar provided with a longitudinal groove extending to near the outer end thereof, a channel formed in the outer end of said bar and extending from said longitudinal groove to the tip of said bar, a reed disposed longitudinally in said groove near the walls thereof whereby there is provided a narrow capillary subchamber beneath said reed for supplying the ink to said channel in the outer end of the bar, substantially as and for the purpose set forth.

6. A fountain-pen comprising a bar formed at its outer end with a writing-point and provided upon one side with a longitudinal ink-groove extending nearly to said writing-point so as to leave a portion of the bar between the outer end of said groove and the said writing-point, a narrow capillary channel extending through the portion of the bar lying between the said writing-point and the outer end of said ink-groove and connecting said groove with the writing-point to supply the ink to such point, a reed lying within said ink-groove, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand, this 7th day of July, 1899, in the presence of the two subscribing witnesses.

ARTHUR A. WATERMAN.

Witnesses:

GUY H. HOLLIDAY,
WARREN P. JACKSON.