

(No Model.)

F. C. BROWN.
FOUNTAIN PEN.

No. 374,140.

Patented Nov. 29, 1887.

Fig. 1.

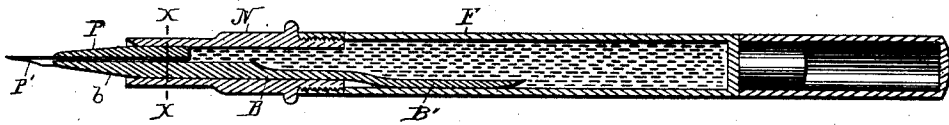


Fig. 2.

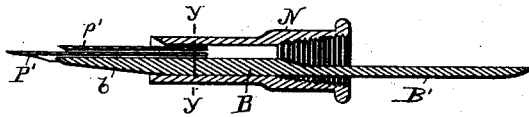


Fig. 3.

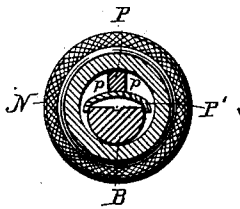


Fig. 4.

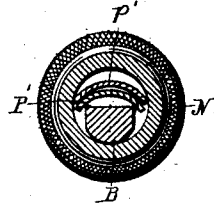


Fig. 5.

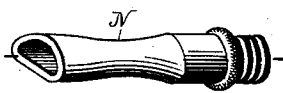


Fig. 6.

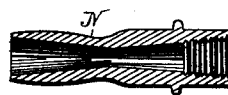


Fig. 7.

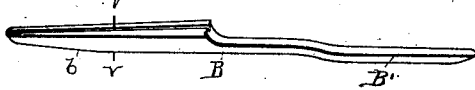


Fig. 8.

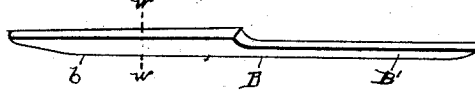


Fig. 9.



Fig. 10.



Witnesses
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FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 374,140, dated November 29, 1887.

Application filed April 15, 1887. Serial No. 234,896. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS C. BROWN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Fountain-Pens; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Referring to the drawings, Figure 1 is a vertical axial section, on an enlarged scale, of a fountain-pen embodying my improvements. Fig. 2 is a vertical axial section of the nozzle, showing a modification in the construction of the same and in the means employed for obtaining air-passages above the pen. Figs. 3 and 4 are transverse sections taken respectively on lines *x x* and *y y* of Figs. 1 and 2. Fig. 5 is an isometric view of a modified construction of nozzle. Fig. 6 is a longitudinal axial section thereof, and Figs. 7 and 8 are detached views of the feed-bar. Figs. 9 and 10 are sections on lines *v v* and *w w*, respectively, of Figs. 7 and 8.

This improvement relates more particularly to a mode of fitting the pen securely into the nozzle, to the arrangement of the ink-feeding devices, and the means employed for affording access of air to the ink-fount to produce a proper flow of ink to the pen.

The invention consists in a mode of fitting the pens and feed bar or bars to the nozzle, and in the construction of the nozzle, feed bar or bars, and their arrangement relatively to the pen, substantially as hereinafter fully described, and as set forth in the claims.

In the construction of fountain-pen as shown in the drawings, I may feed the ink to the under side of the pen only by means of a feed-bar of any suitable form, preferably of the form shown in Fig. 3, or to both the under side and top of the pen, as hereinafter described.

In feeding to the under side of the pen I employ the following devices: a feed-bar, B, having a body, *b*, of substantially semi-cylindrical form and of a suitable taper for that portion

of the body of the bar that lies under the nibs of the pen. By making the body of the feed-bar semi-cylindrical in cross-section I am enabled to employ a standard feed-bar for pens varying in size within certain limits, and am enabled to employ these feed-bars and fit them to smaller-sized pens by simply reducing the body of the feed-bar by filing the edges away. In this manner a feed-bar adapted for use for a given size of pens—say, for instance, the largest-sized pen usually employed in fountain-pens—may also be used for any pen smaller than such standard or largest size. In Fig. 6 I have shown a bar the body of which has been so reduced. The upper or ink-feeding face of the feed-bar B is perfectly flat, so that when placed under the pen an ink-duct will be formed between the adjacent faces of the pen and feed-bar, in view of the fact that the proximate faces are concave and plane, respectively.

Heretofore feed-bars for feeding the ink to the under side of the pen have been generally so constructed as to form an ink-reservoir below the nibs of the pen or slightly in rear thereof. This has been effected by scooping out the body of the feed-bar at the proper point, or making it curvilinear at that point, to hold a quantity of ink. I have, however, found that this is not necessary when the feed-face of the feed-bar—that is to say, that face thereof which lies in proximity to the under side of the pen—is made flat.

When small and narrow pens are employed, the ink-duct is of very limited area, and to promote the flow of ink I form a longitudinal groove or a plurality of such grooves, *b'*, in the upper flat or feed face of the bar B, as shown in said Fig. 6. The feed-bar has an attenuated shank, *B'*, that extends into the ink-fount to conduct the ink to the under side of the pen.

To provide suitable air-passages for admitting air to the fount, I interpose between the upper face of the pen and the wall of the nozzle a plug, P, that does not project into the fount, but terminates at or near the heel of the pen and forms on opposite sides thereof, between the pen P' and the wall of the nozzle N, air-passages *p*. As shown in Fig. 1, the plug P extends well forward over the split of the nibs of the pen, although this is not absolutely necessary; yet I find it to be of great advan-

tage, as means are thereby provided to conduct ink from the under side to the top of the nibs by capillary attraction.

It will readily be seen that in writing the nibs are spread, ink from underneath the pen passing through the split, and is held by capillary attraction by the outer end of the plug P, that then feeds the said ink to the upper face of the nibs. This has another advantage, in that the difficulty of conveying ink to the nibs when the pen has been out of use for any length of time is thereby facilitated, as the ink held by capillary attraction along that portion of the plug which lies outside of the nozzle on the pen is the first to find its way to the nibs. The difficulty usually encountered in starting to write to carry ink to the nibs of the pen is thus avoided. The same results may be obtained by using two pens, one above the other, as shown in Figs. 2 and 4.

It is well known that a pen having a tapering shank cannot be fitted into a nozzle having a straight or cylindrical bore without working loose therein; and for the accommodation of pens having such a shank the outer portion of the nozzle has heretofore been constructed with an inwardly-tapering bore. If, however, the taper of the bore does not exactly fit the taper of the pen-shank, the pen will also work more or less loose. On the other hand, pens of a given size can be employed only with a nozzle having either a straight or cylindrical or a tapering bore.

With my method of fitting pens I am enabled to use a nozzle having a cylindrical bore for pens having either a straight or a tapering shank and of various sizes within certain limits. A nozzle having a bore of a given size will accommodate a pen having a straight shank of a corresponding size, and no other pen will fit accurately into it. I have found, however, that I can fit pens several sizes larger than those intended for the nozzle, having either a straight or a tapering shank, by heating the nozzle to render the rubber pliable, then placing the plug P or top feed-bar onto the pen and forcing the two together into the more or less pliable nozzle. The nozzle will then assume a more or less prismatic or oval or ellipsoidal shape, and if the pen has a tapering shank the bore of the nozzle will also become tapering and take the accurate form of the pen-shank, so that such pen will be firmly secured therein, together with the plug or top feed-bar, a space below the pen being left for the introduction of the under feed-bar. In this manner the shape of the nozzle may be altered to suit various forms and sizes of pens whenever it is desired to make a change in such pens by proceeding as above described—an advantage readily understood by those manufacturing or using this class of pens. This form is shown more plainly in Figs. 5 and 6, the pen being held in the prism-shaped mouth and tapering bore against working loose.

I have found that a fountain-pen constructed as described will give excellent results in writ-

ing; but I have also found that when the volume of air admitted is not properly regulated to the flow of ink an excess of air accumulates in the fount in rear of the pen, which, when the pen is not in use and inverted for carrying the same in the pocket, not only prevents the ink from flowing back into the fount, but tends to force the ink in front of the air-cushion over the end of the nozzle into the cap which covers the pen when not in use.

It is very difficult in this class of pens to accurately determine the volume of air that should be admitted to the fount and to avoid the labor and expense of a nice adjustment of the plug P and make the necessary provisions to allow the air to escape from the fount and the ink to recede or flow back into the same when the pen is inverted. I so construct the nozzle and feed-bar as to afford a greater area in rear of the pen than at the point at which such pen is held in the nozzle, and construct the bar B so that its shank will lie close to the wall of the nozzle and fount. To these ends I enlarge the bore of the nozzle N by making it tapering or otherwise from or about from heel of the pen to the inner end of said nozzle, to increase the diameter of the nozzle in the direction of the fount F, so as to leave a space practically unobstructed, to facilitate the escape of the air and the flowing back of the ink, the shank of the feed-bar being so shaped as to lie close to the wall of the nozzle N and fount F, as shown in Figs. 1 and 2.

Having now described my invention, what I claim is—

1. In a fountain-pen, the combination, with the ink-fount and the nozzle, of a feed-bar arranged to feed the ink to the under side of the pen and having a shank extending into the fount and lying in close contact with the inner wall thereof and with the like wall of the nozzle, and a plug, P, or its equivalent, arranged above the pen between it and the wall of the nozzle and terminating in the latter at or about at the heel of the pen, substantially as and for the purpose specified.

2. In a fountain-pen, the combination, with the ink-fount and nozzle, of a feed-bar provided with a shank extending into the fount and a semi-cylindrical portion which extends out beneath the pen, the flat face of said portion extending from the tip of the bar to the shank thereof and being arranged proximate to the pen to form an ink-duct between the proximate faces of said pen and feed-bar, as described.

3. The herein-described under feed-bar having that portion which lies beneath the pen of substantially a semi-cylindrical form in cross-section and provided with an attenuated shank, the flat face of the semi-cylindrical portion of the bar extending from the tip thereof to the shank, for the purpose specified.

4. The herein-described under feed-bar having that portion which lies beneath the pen of substantially a semi-cylindrical form in cross-section, a groove or grooves in the flat

face of said semi-cylindrical portion, and an attenuated shank, the flat face of the semi-cylindrical portion of the bar extending from the tip thereof to the shank, for the purpose specified.

5 5. The herein-described mode of utilizing a hard-rubber nozzle having a cylindrical bore with pens having a shank of greater diameter than said bore, or having a tapering shank, which consists in rendering the nozzle pliable by means of heat and introducing the pen to cause said nozzle to assume the shape thereof.

10 6. The herein-described mode of utilizing a

nozzle having a cylindrical bore with pens 15 having a shank of greater diameter than said bore, or having a tapering shank, which consists in rendering the nozzle pliable by means of heat and introducing the pen, together with the plug P or top feed, to cause said nozzle to 20 assume the shape thereof, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS C. BROWN.

Witnesses:

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JULIUS GOLDSTONE.