(No Model.)

F. C. BROWN.

FOUNTAIN PEN.

No. 345,411. Patented July 13, 1886.

Fig. 11

Fig. 10

Fig. 9

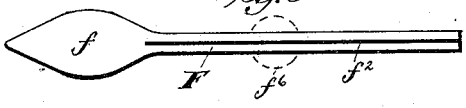


Fig. 5

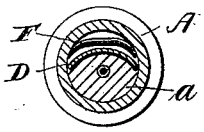


Fig. 7.

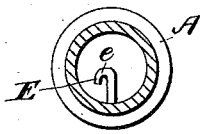


Fig. 8.

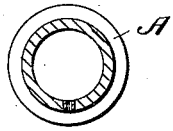


Fig. 4

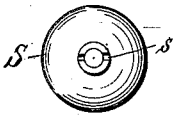


Fig. 1

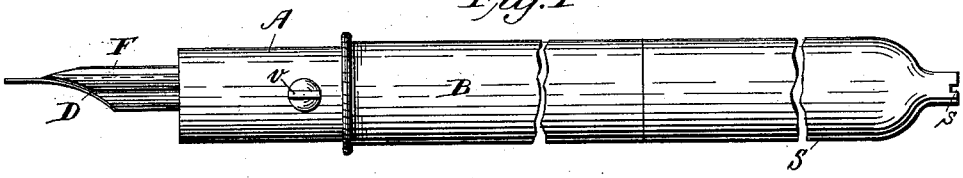


Fig. 2

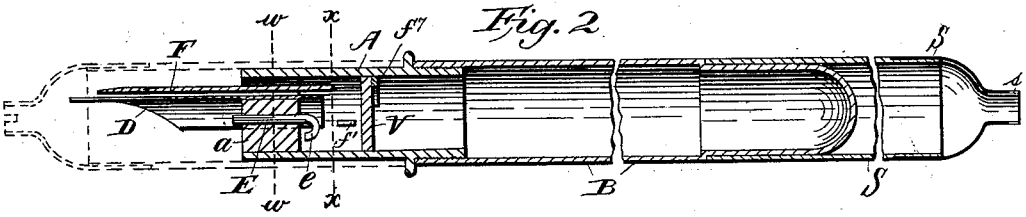


Fig. 3

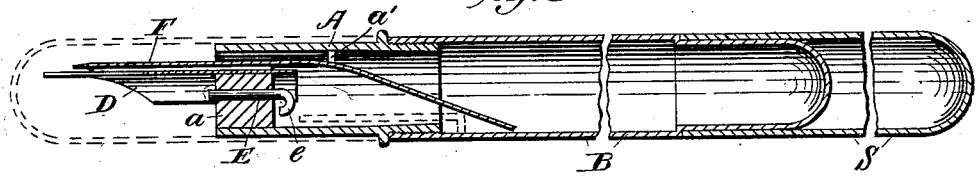
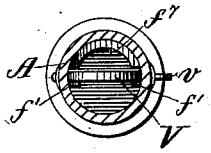


Fig. 6



Witnesses:
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O. M. Knobloch.

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Francis C. Brown,
per Henry A. Wise
his atty.

UNITED STATES PATENT OFFICE.

FRANCIS C. BROWN, OF NEW YORK, N. Y.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 345,411, dated July 13, 1886.

Application filed March 18, 1886. Serial No. 195,717. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS CASHEL 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 appertains 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.

My invention has for its object certain improvements in that class of fountain-pens in which the ink is fed to the top of the pen; and it consists, essentially, in a novel arrangement of feed-bar in combination with the ink reservoir or fount and the nozzle or pen-point section, substantially as herinafter fully described.

The invention further consists in a novel arrangement of air-vent and construction of vent-tube, substantially as hereinafter fully described.

The invention further consists in the combination, with the ink fount or reservoir, of a cut-off valve, substantially as hereinafter fully described.

Referring to the accompanying drawings, Figure 1 is a side elevation of a pen embodying a portion of my improvements. Fig. 2 is a longitudinal vertical central section of Fig. 1. Fig. 3 is a like view showing an improved arrangement of feed-bar when the valve is not used. Fig. 4 is an outer end view of the pen. Figs. 5 and 6 are transverse sections of the pen, taken on lines *w w* and *x x* of Fig. 2, the valve being shown open in Fig. 6. Figs. 7 and 8 are transverse sections of the nozzle, showing a different arrangement of air-vents. Figs. 9 and 10 show by a top and under side plan view, respectively, one form of feed-bar. Fig. 11 shows by an isometric view another form of feed-bar.

In the above drawings, and referring more particularly to Figs. 1, 2, and 6, A indicates the pen section or nozzle; B, the ink reservoir or fount screwed to the nozzle, as usual, and S the shield or guard for the pen-point when not in use.

The nozzle A has a front wall or plug, *a*, that forms the seat for the pen-point D, and F is the feed-bar arranged above the pen-point. The plug *a* may be constructed of a rigid or a flexible material—such as hard rubber or soft rubber or cork—and forms a sufficiently tight joint to prevent ink from the fount passing between the pen and the plug.

The feed-bar F is constructed with an enlargement, *f*, that lies over the pen-point, the rear of said feed-bar extending into the nozzle in rear of the plug *a*.

The necessary air to be supplied to the nozzle or fount to cause a proper flow of ink may be admitted through a small hole formed in the periphery of the nozzle, as in Fig. 7; or a vent-tube, E, may be inserted in the hole, which should preferably be located at a point in the periphery of the nozzle opposite to the line of flow and exit of the ink, and preferably as close to the plug *a* as possible. The air-vent may also be formed in the plug *a*, or a vent-tube inserted in said plug.

When the vent or vent-tube is located in the periphery of the nozzle, there may be a liability of the ink oozing out of the vent and soiling the hands, and when the vent or vent-tube is located in the plug or front wall, *a*, of the nozzle this will fill with ink and prevent the air from entering the fount, thereby suspending the flow of ink to the fount.

It is well known that in this class of pens it is necessary to shake the pen more or less violently to cause the ink to flow along the feed-bar when the pen has been out of use for some time. When an air-vent is employed that is located in a plane parallel with that of the flow of the ink to the pen, the ink, on shaking the pen for the purposes described, is projected through the vent or vent-tube, fills the same up, and stops the supply of air to the fount or reservoir, when it becomes necessary to invert the pen and clean the vent. These difficulties I overcome by the use of a vent-tube, E, that projects into the nozzle and has its end *e* within said nozzle bent, and preferably bent in the direction of the flow of ink to the pen, whether the vent-tube is ap-

plied to the plug or the periphery of the nozzle, as shown. The vent-tube may also be located in the periphery of the fount and bent so as to extend forward into the nozzle, as shown in dotted lines in Fig. 3.

One of the great inconveniences found in this class of pens is that the flow of ink while writing is often so great as to cause the ink to drop from the pen-points. To overcome this difficulty I use a feed-bar, F, of such a length that when introduced into the nozzle or pen section it will lie with its rear end in an inclined plane extending from a point above the shank or rear end of the pen rearwardly and downwardly in contact with the periphery of the nozzle or the fount, as shown in Fig. 3. This inclination of the feed-bar across the passage of the nozzle or fount, or both, may be obtained in various ways, either by bending the feed bar at a point in rear of the pen or its shank or by forming within the passage of the nozzle an abutment or shoulder, a', under which the feed-bar is passed, and that holds the same in the inclined position, as shown in Fig. 3, to hold the body of ink from exerting its full pressure in the exit-passage of the pen. The feed-bar may be made of even width throughout, except that portion which lies over the pen, or of such width that its lateral edges will lie in contact with the walls of the nozzle or fount, or both; or said feed-bar may be made narrower than the passage in the nozzle or fount. A somewhat similar result may be obtained by the use of a cut-off valve, as hereinafter explained.

In this class of pens as usually constructed I find that the ink will not readily flow back from the pen into the fount, and to cause said ink to flow back into said fount more readily I form in the upper face of the feed bar a groove or ink-duct, f^2, which I find promotes the flow of ink toward the fount or reservoir without feeding ink to the top of the feed-bar, said groove extending preferably from a point in rear of the enlarged portion of said bar to its inner end. In its under side the bar may be provided with grooves or fissures f^4, to form ink-ducts to convey the ink from the fount to the top of the pen, though that is not essentially necessary, yet I prefer it, especially when the feed-bar lies in close proximity to or in absolute contact with the pen D. To still further regulate the flow of ink to the pen D, and thereby to prevent too large a volume of ink being fed to the pen, I form in the under side of the feed-bar transverse grooves f^5, which I call "retarding-ducts," as they practically retard the flow of ink while they hold at all times the necessary volume of ink to supply the pen D while writing.

I have stated above that the feed-bar F has an enlarged portion, f, that lies immediately above the pen D. This enlargement I make of such width as to fit closely the walls of the nozzle above the plug to form a tight joint between the space above and below the feed-bar or between said space above the feed-bar and the pen D, so as to prevent ink from passing along the edges of the feed-bar and pen or between said edges to the upper face of said feed-bar, which would tend to produce too free a flow of ink. This may also be obtained by giving to the enlarged portion f of the feed-bar F substantially the form of a pen, as shown in Fig. 11, its upper face being flat to leave a passage between it and the wall of the nozzle A.

Inasmuch as the enlarged portion f of the feed bar fits tightly into the nozzle above the pen, its inclination to bisect the interior passage of said nozzle may be obtained by forming an enlargement, f^6, at a point about midway of its shank or portion in rear of the enlargement f, of about the same diameter as the bore of the nozzle, such enlargement forming a fulcrum-point.

Instead of the projection or shoulder to give the feed-bar the necessary inclination, a pin may be passed through the nozzle, as will be readily understood.

In the class of pens to which this invention relates there is usually no provision made to entirely cut off the supply of ink to the pen.

When these pens are to be carried on the person, it is necessary to carry them with the pen-points upward to prevent the usual cap that protects the pen-points against injury from filling with ink. To avoid this difficulty, and also to enable me to use a tubular open-ended shield or guard for the pen-points, which materially reduces the cost of construction of the pen, I employ in the nozzle, or reservoir if no nozzle is employed, a disk-valve, V, pivoted therein as close as possible to the front wall or plug, a, of the pen. One of the pivots of the valve has a squared or flattened end, v, Figs. 1 and 6, to afford a hold for a suitable key, by means of which the valve is rotated; or said pivot may be provided with a button or other suitable device for rotating the same. I prefer, however, to flatten the pivot and slot the end of the tubular shield or guard S, as shown at s, Figs. 1, 2, and 4, thus adapting the shield for use as a key, said shield S consisting of an open-ended tube, which to fit the pivot may be contracted at one end, as shown in Figs. 1 and 4; or, if desired, a suitable key may be fitted to the end of the shield, as shown in Fig. 2. The flattened or key end v of the valve-pivot may be so positioned relatively to the valve V as to indicate the position of the latter within the fount. For instance, if the flattened end is arranged so as to lie in the plane of the valve it would indicate the position of the latter within the nozzle, as it is obvious that when said flattened pivot v lies in the plane of the longitudinal axis of the pen the valve will lie in a corresponding or open position, and when said flattened end lies in a plane at right angles to the valve, the valve will lie in a like position and close the passage of the nozzle. Yet in manipulating the valve to close the passage of the nozzle there is a lia-

bility of its being carried too far or not far enough, in either of which cases the passage of the nozzle will not be effectually closed thereby. To avoid this I provide the fount in rear of the valve with a semi-cylindrical shoulder, f', that forms a seat against which the valve abuts when rotated to close the passage in the fount, thus forming a stop that will effectually prevent the valve from being carried too far from the position which it should occupy to close the said passage. If desired, longitudinal ribs f' may be provided on opposite sides and in front of the pivots of the valve and on a line sufficiently below the line of the pivots to permit the valve V when in a horizontal position to lie on said ribs f', which thus are made to form shoulders or abutments, that prevent the valve from being turned too far down in the act of opening the passage for the ink to flow to the pen.

It is obvious that by properly positioning the valve—say, for instance, at an angle of about forty-five degrees to the horizontal—the said valve will serve, like the shank or rear end of the feed-bar F, to support the body of ink in the fount, and thereby prevent its exerting its entire pressure in the exit-orifice, as hereinabove described.

Gold pens made especially for use with the various constructions of top feed fountain pens have heretofore been used; but with my improved construction of fountain-pen any one of the gold or steel pens now to be found in the market and adapted to be inserted between the feed-bar and plug a may be employed, which is a material advantage in this class of pens.

I am aware that it is not new to feed the ink from the ink-fount to the top of the pen by means of a feed-bar overlying said pen. I am also aware that feed-bars arranged above the pen provided with an enlargement to hold the same in the nozzle or pen-holder section and extending over said pen and into the ink-fount have been used prior to my invention.

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

1. In a fountain-pen, a feed-bar projecting into the nozzle or fount in rear of the pen to diagonally bisect the interior passage or bore of said nozzle or fount, for the purpose specified.

2. In a fountain-pen, a feed-bar arranged to feed the ink to the top of the pen, having the enlargement f fitting tightly in the nozzle or fount above the front wall or plug, a, thereof, and an attenuated shank extending into the said nozzle or fount to diagonally bisect the interior passage or bore thereof, for the purposes specified.

3. In a fountain-pen, a feed-bar adapted to feed the ink from the fount to the top of the pen, provided with a groove in its upper face, for the purpose specified.

4. In a fountain-pen, a feed-bar, F, having one or more grooves formed in the under side of its enlargement f, that extend from the tapering portion thereof toward or to its attenuated shank, substantially as and for the purpose specified.

5. In a fountain-pen, a feed bar for feeding ink from the fount to the pen, having a longitudinal groove or duct formed in its upper and lower faces, and a groove or duct running at an angle to and intersecting the groove or duct in the under face of the bar, substantially as and for the purpose specified.

6. A feed-bar for fountain-pens, having the lateral edges of that portion which lies over the pen turned down and provided with an attenuated extension or shank projecting rearwardly from said portion, substantially as and for the purpose specified.

7. A feed-bar for fountain-pens, having substantially the form of a pen, provided with a duct or groove in its upper face and with an attenuated shank extending therefrom, substantially as and for the purpose specified.

8. In a fountain-pen, the combination, with the nozzle or ink-fount, of a vent-tube in one of the walls thereof projecting into said nozzle or fount and having its end therein bent as described, for the purpose specified.

9. In a fountain-pen, the combination, with the nozzle or fount, of a pivoted disk adapted to be set at an angle to bisect the bore of said nozzle or fount diagonally and support the body of ink therein and form passages for the ink from the fount to the pen, substantially as and for the purpose specified.

10. In a fountain-pen, the combination, with the fount and nozzle or holder and a plug in the end thereof, forming the seat for the pen, of a feed-bar fitted in said nozzle above the plug, a vent or duct above the feed-bar and between it and the wall of the nozzle, and a duct or vent below said feed-bar and between it and the pen when seated on the plug, substantially as and for the purpose specified.

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

FRANCIS C. BROWN.

Witnesses:

WILLIAM E. BOULTER,

FRANK M. GREEN.