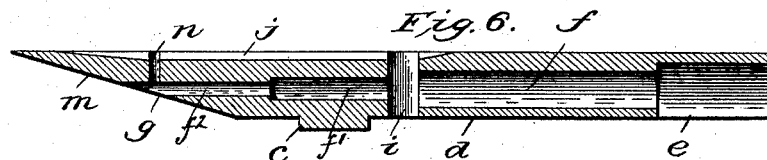
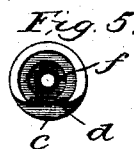
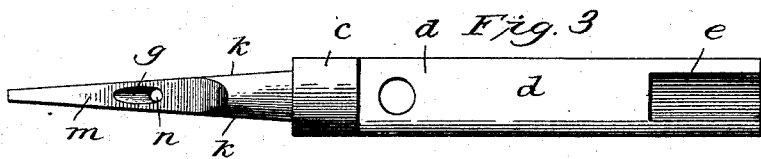
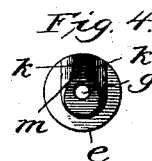
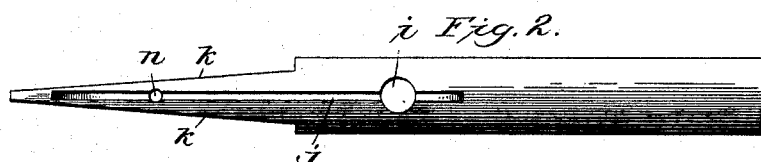
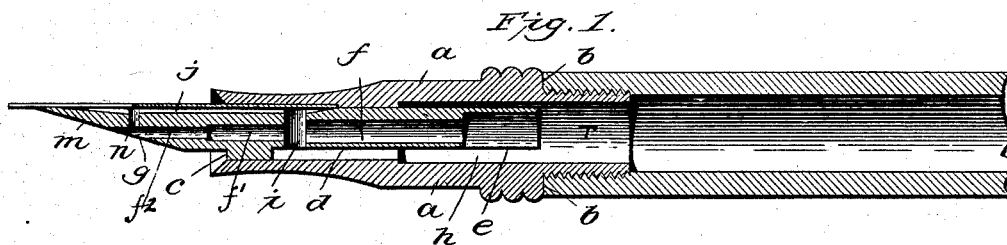


(No Model.)

D. C. DEMAREST.
FOUNTAIN PEN.

No. 522,751.

Patented July 10, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

DEWITT C. DEMAREST, OF CHICAGO, ILLINOIS.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 522,751, dated July 10, 1894.

Application filed December 18, 1893. Serial No. 493,947. (No model.)

To all whom it may concern:

Be it known that I, DEWITT C. DEMAREST, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Fountain-Pens, of which the following is a specification.

For pens in which the ink is supplied from a chamber in the handle or pen-holder, I have produced an improved ink-feeding device for said supplying chamber, constructed to feed the ink to and beneath the pen as it is required in writing. The construction of this feed-device is such as to prevent the gumming of the feed-ducts; to prevent leakage from the feeder; and to cause the exhausting of the ink-duct to open air communication with the supply-chamber to refill the said ink-duct and thus supply the pen.

In my new feeder-device provision is made for allowing the ink to run from the feeder into the ink-chamber on reversing the position of the holder to free the ink from the pen and from the groove which supplies it from the ink-duct.

The accompanying drawings illustrate a fountain pen having my improved ink-feeding device and in connection with which I will specifically point out my improvement in the claims concluding this specification.

Referring to the drawings: Figure 1 shows in longitudinal section a fountain pen having my feeder-device as used with the pen. Fig. 2 shows the feeder-device in top view. Fig. 3 shows the same in bottom view. Fig. 4 shows the outer end of the feeder; Fig. 5 the inner end of the same; and Fig. 6 is an enlarged sectional view of the feeder device.

The reservoir or supply-chamber, the pen-holding nozzle or plug, and the cap for the pen are made in the usual way.

The pen holding nozzle or plug *a* is screwed into the end of the ink-chamber against a shoulder *b*, on said plug and is tubular to receive the closely fitting ink-feeder-stem.

The ink-feeder device is a tube or stem which fits in the screw-plug and closes its outer end at *c* which forms the cylindrical part *c* of said tube or stem. From this part *c* the tube has a flat surface *d* which extends to its inner end at which end this flat surface is cut out to form an opening *e* at the

side of a central duct *f* in said tube which extends through the latter and opens at the under side at *g* and at the outer end of said tube. The flat side of the tube is to form a space *h* between it and the inner wall of the plug or nozzle, to allow the ink to run down and fill this space just back of the shoulder part *c*.

The opening *e* extends from the end of the stem a sufficient distance on its flat side to give a free entrance of the ink into the space *h*, into and down which the ink runs by gravity outside the tube when the pen is being used. This opening *e* also allows the free entrance of air-bubbles into the ink-chamber as I will presently state. The transverse hole *i* intersects the central duct or channel *f* and opens at the side of the tube or stem under the pen and from this end of the hole a groove *j* is made in the surface and extends to near the outer end of the stem. This end of the stem is made pointed, with flat sides *k*, *k*, joining the cylindrical part *c*, and its under side is beveled at *m* to the point. A small hole *n* intersects the center duct or channel and the surface groove *j* and opens at the under point bevel *m* at which point the center duct or channel also opens.

The pen is secured in the plug so as to lie upon the feeder-stem over its groove *j* and its two intersecting transverse holes, so that the central duct *f*, *f'*, *f''*, and surface groove *j*, their intersecting holes *i* *n* and the space *h* formed by the flat side of the stem, communicate with each other to effect the feed of the ink to the pen and the inlet of the air to the ink-chamber as I will now state.

The provision of the end opening *e* at the flat side *d* of the tube or stem allows the ink to run down into the space *h* by gravity when the pen is turned down in writing, so that the inner end of the feeder-stem is thereby caused to remain open to allow the air-bubbles to pass into ink-chamber until the flow of ink into the said space, reaches the transverse hole *i* which it then enters and closes and stops the inflow of the air-bubbles into the ink-chamber. The ink passes from the transverse hole *i* into and fills the central channel *f*, *f'*, *f''*, from said hole *i* to the open end of said central duct or channel at the bevel *m*, and at the same time the ink from

said transverse hole i enters the surface groove j under the pen and flows to the point opening n . The ink in the outer portion of the central duct or channel f' , f^2 , communicates with and serves to supply the pen at the transverse hole i and this outer portion of the central channel between these two holes i , and n , is kept supplied from the chamber space h . The inner portion f of the central channel is therefore an air duct only and remains open.

In writing the ink is drawn by capillary attraction under the pen and is so drawn from the hole i and the central channel f' , f^2 . As the ink is so drawn to the pen and exhausted from the central channel the air will enter this channel at the bevel m and pass into the ink-chamber at the opening g in bubbles and thereby remove the air tension from the ink in the space h and allow it to run into the hole i and again fill the central channel or duct between the transverse holes. This flow of the ink again cuts off the entrance of the air into the duct and in this way the ink is supplied to the pen through the space h and transverse opening i ; while the central channel when not filled with ink, permits air to enter the ink-chamber. The hole n at the point of the stem gives the advantage admitting air to the groove j and thereby drive the ink from said groove back into the space h when the pen is reversed and not in use, and prevents the groove from gumming up and also keeps the under side of the pen free from ink when not being used.

The central channel f from the inner end to the transverse hole i should be drilled with a No. 49 twist drill; the hole i with a No. 50 twist drill, and the groove j with a No. 22 gage saw. The central channel from the hole i to the bevel m should be drilled with a No. 53 and a No. 55 drill for short pens and with a No. 55 drill for long pens.

The opening e is oblong and is nearly as wide as the diameter of the stem and opens into the space h , which is formed by the ink-chamber wall, the stem shoulder c and the flat side of the stem, and it is from this space that the ink is supplied to the pen through the transverse hole i but such supply is not direct, but is through only the outer portion f' , f^2 of the central duct and it is this construction which causes the feed of ink to regulate such feed in connection with the stopping of the air-vent by such feed across the air-duct. In this action of the ink and air it is the provision by which the central duct is divided transversely that causes the inner end of the tube to remain open and the ink to flow down on the outer side of said stem and into that portion only of said duct which opens at the point.

The shoulder c of the feed tube fits closely into the nozzle part a and back of this shoulder the bore of the nozzle is made larger so that the space h will be all around the flattened portion of the feed tube for the ink to

surround this portion of said tube. This space however, has no communication with the pen except through the transverse hole i . The open flat end of the feed tube must not extend to the inner end of the pen holder or nozzle, but leave a clear space r into which said space h opens.

While the opening e in the feed-tube allows the ink to run freely into the space h , it also allows the ink to run out of said space on holding the pen upward and thus keep the ducts free from gumming. While the ink is running down into the space h and into the hole i the part f of the central channel forms an air chamber and by the presence of air is kept free of ink.

The space h , the hole i , and the outer portions of the central channel, form the reservoir which supplies the pen. The feed tube channel is divided into different sizes, the part f at the inner end being the largest to facilitate the passage of the air bubbles into the holder-chamber, while the part f^2 at the outer end is the smallest and forms the inlet for the air bubbles; the intermediate part f' being larger than the part f^2 , opens into the ink supplying hole i , and these two channel parts each opening into the pen supplying groove j , one by the hole n and the other by the hole i serve to properly supply the pen with ink, while confining the air supply to the central channel and preventing the dropping of the ink.

The channels f' , f^2 may be of the same size, while the point hole n is smaller than the channel f^2 and the hole i is larger than the channel f' but these ducts may be varied in size, the construction shown being best adapted for small pens.

I claim as my improvements—

1. In a fountain pen, the feed-device consisting of the central channels f , f' , f^2 , intersected by the transverse holes i , n , the surface groove intersecting said transverse holes, the circumferential shoulder c , the flat side d , and the opening e , at the end of said flat side, combined with a nozzle or plug a having the space h around said flat side and open end e , substantially as described.

2. In a fountain pen, a feed-device adapted to feed the ink from the supply-chamber to the under side of the pen, consisting of a tube or stem provided with a central longitudinal duct or channel open at both ends, a transverse hole through said tube intersecting said central duct about midway of its length, said tube having a flat side from said transverse hole to its inner end, and an end opening on the flat side for the purpose stated.

3. In a fountain pen, a feed-device adapted to feed the ink from the supply-chamber to the under side of the pen, consisting of a tube or stem provided with a central longitudinal duct or channel open at both ends, flattened on one side about half its length, a transverse hole through said tube intersecting said duct and flat side, and a groove on its opposite side

intersecting said transverse hole and extending to the outer end for the purpose stated.

5 4. In a fountain pen, a feed-device adapted to feed the ink from the supply-chamber to the under side of the pen, consisting of a tube or stem provided with a central longitudinal duct or channel open at both ends, flattened on one side from the middle of its length to its inner end, a groove on its opposite side extending to the point or outer end, a transverse hole intersecting said central duct and the flat side and a transverse hole intersecting said central duct and surface groove for the purpose stated.

15 5. In a fountain pen, the combination of the chamber forming part and the nozzle or plug, with a feed-device arranged to feed the ink to

the under side of the pen, consisting of a tube or stem seated within said nozzle, provided with a central longitudinal duct or channel 20 open at both ends, a groove on one side extending to the outer point, and a flat part on the opposite side extending to the inner end forming a space between the wall of the plug and that side of the tube, a side opening at 25 the end in said flat part, and a transverse hole intersecting said surface groove, central duct and space, midway of said tube for the purpose stated.

DEWITT C. DEMAREST.

Witnesses:

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ED ZECH.