

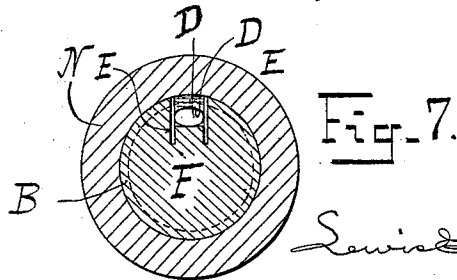
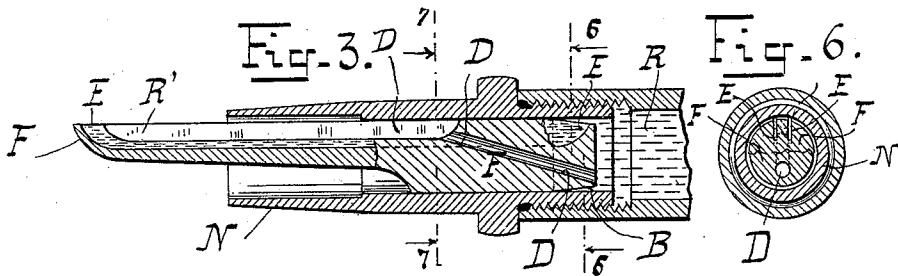
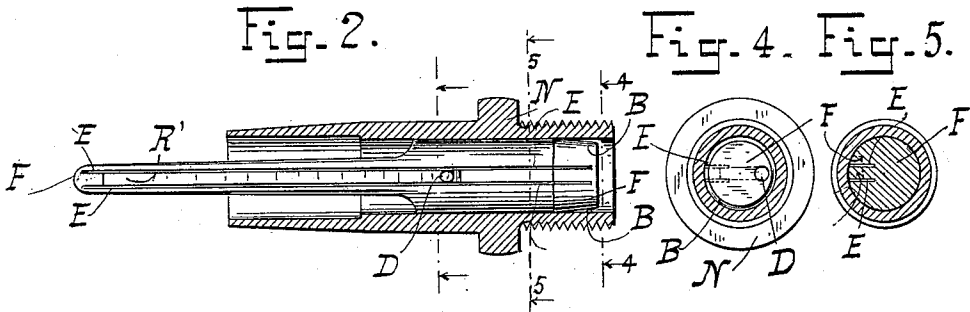
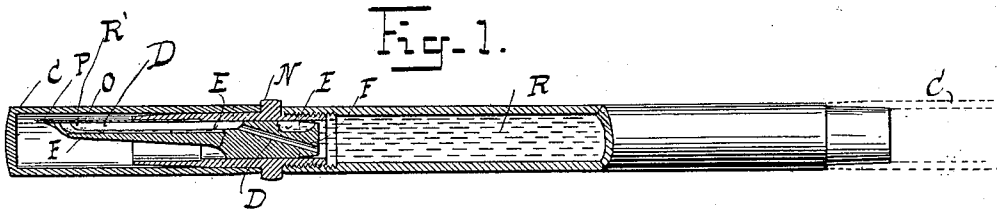
No. 607,398.

Patented July 12, 1898.

L. E. WATERMAN.  
FOUNTAIN PEN.

(Application filed Aug. 24, 1897.)

(No Model.)



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Inventor

Witnesses  
Charles Hanemann  
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# UNITED STATES PATENT OFFICE.

LEWIS E. WATERMAN, OF NEW YORK, N. Y.

## FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 607,398, dated July 12, 1898.

Application filed August 24, 1897. Serial No. 649,362. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS E. WATERMAN, a citizen of the United States, residing in the city of New York, (Brooklyn,) county of Kings, and State of New York, have made a new and useful Invention in Fountain-Pens, of which the following is a specification.

My invention relates to improvements in fountain-pens or pens in which the ink is carried in the reservoir and fed to the writing-pen automatically by its own use; and the objects of my improvements are, first, to provide an annular or approximately annular capillary channel or passage-way into which the ink must first pass from the reservoir on the way to the writing-pen; second, to connect the annular capillary channel or passage-way with the longitudinal capillary fissures in the plug part of the feed-bar and in the walls of the air-duct, and, third, to combine these capillary channels or passage-ways and fissures with the reservoir and the subreservoir under the pen provided with an air valve or inlet. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a part-sectional view of the fountain-pen. Fig. 2 is a horizontal sectional view of the nozzle and a top view of the feed-bar. Fig. 3 is a vertical sectional view of the nozzle, the feed-bar, and the adjacent parts of the reservoir. Fig. 4 is a sectional view of the nozzle and an end view of the feed-bar, cut on the line 4 4, Fig. 2. Fig. 5 is a sectional view cut on the line 5 5, Fig. 2. Fig. 6 is a sectional view cut on the line 6 6, Fig. 3; and Fig. 7 is a sectional view cut on the line 7 7, Fig. 3.

Similar letters relate to similar parts throughout the several views.

The reservoir R is provided with the nozzle N, connected therewith in the manner shown or in any other usual way, and the nozzle N is provided with the feed-bar F, having the secondary reservoir R', the capillary fissures E, and the air-duct D. At and near its rear end the feed-bar F is beveled around the entire end surface of the plug portion of the feed-bar for a portion of the distance from the rear end forward, leaving a narrow conical annular chamber B open to contact of the ink in the reservoir R, which it transfers by

or through its capillary function to the capillary fissures or passage-ways E, as the ink may be drawn from the secondary reservoir R', from the air-duct to some extent, and from the capillary fissures E and to furnish fresh supply of ink to the secondary reservoir.

In transferring the ink from the reservoir R to the fissures E the whole operation is by capillarity and by lifting the ink around the outside of the inner end of the feed-bar until it reaches the fissures E E at their top edges, and when the fissures and the capillary chamber B are once filled they hold a continuous web or supply of ink until the ink in the reservoir is exhausted, passing the ink around the air or air-bubbles in the air-duct D. The rear end of the air-duct D is inclined downward and finds outlet at the bottom of the inner end of the feed-bar, which outlet consequently remains covered as long as any ink remains in the reservoir R, and as the fissures E preferably do not extend into the reservoir R they must derive their supply from the annular capillary channel or passage way B and remain constantly filled with ink through the powerful capillary action of the chamber B, thereby relegating the route of the air-supply of the reservoir R to the channel D, with inlet at the bottom of the ink in the reservoir R.

The fissures E might be cut through into the reservoir or so as to be in contact with the ink therein; but not only when the reservoir R is full, but even when it is nearly empty, and, indeed, until it is quite empty, the powerful capillary action in the channel B will carry the ink to and fill the inner ends of the fissures or passage-ways E as long as there is any ink within reach and so prevent the access of air to the reservoir through these fissures. For convenience of manufacture they may be cut through and sealed up afterward. I prefer to form the channel B by beveling the plug part of the feed-bar around and adjacent to its inner end. A similar channel may, however, be formed by leaving that part of the feed-bar straight or unbeveled and making a corresponding bevel in the inner surface of the nozzle, by and through which the ink will be transferred to and eventually through the capillary channels E E in the same manner as hereinbefore described.

The action or function of the air-duct D, fissures E E, and particularly of the annular channel B is under the control of the writing-pen P, the secondary reservoir R', and the air-inlet opening O, or of any other opening or air-inlet in or under the writing-pen P.

The adjacent surface of the inner end of the nozzle N may be reamed out so as to form an annular capillary channel, chamber, or passage-way for ink with a straight feed-bar. In some respects this would be a preferable method of construction to that shown where the inner end of the plug part of the feed-bar is beveled externally from the inner end forward, and the corresponding part of the nozzle-chamber is left straight.

I claim as my invention—

1. A feed-bar of a fountain-pen beveled externally at and in front of the inner end so as to form a capillary channel or passage-way for ink from the reservoir, substantially in the manner and for the purpose set forth, in combination with an air-duct opening into the reservoir at the bottom or lower side of the feed-bar and with capillary channels or passage-ways for transferring the ink from the reservoir to the pen and cut into the body of the feed-bar.

2. A feed-bar of a fountain-pen beveled externally at and in front of the inner end so as to form a capillary channel or passage-way for ink from the reservoir, substantially in the manner and for the purpose set forth, in combination with capillary channels or passage-ways for transferring the ink from the reservoir to the pen and cut into the body of the feed-bar.

3. A feed-bar of a fountain-pen beveled externally at and in front of the inner end so as to form a capillary channel or passage-way for ink from the reservoir, substantially in the manner and for the purpose set forth, in combination with capillary channels or passage-ways for transferring the ink from the reservoir to the pen, both walls of which are formed in the body of the feed-bar.

4. A feed-bar of a fountain-pen beveled externally at and in front of the inner end so

as to form a capillary channel or passage-way for ink from the reservoir, substantially in the manner and for the purpose set forth, in combination with an air-duct opening into the reservoir at the bottom or lower side of the feed-bar, with capillary channels or passage-ways for transferring the ink from the reservoir to the pen and cut into the body of the feed-bar, in combination with a secondary reservoir under the pen.

5. A feed-bar of a fountain-pen beveled externally at and in front of the inner end so as to form a capillary channel or passage-way for ink from the reservoir, substantially in the manner and for the purpose set forth, in combination with capillary channels or passage-ways for transferring the ink from the reservoir to the pen and cut into the body of the feed-bar, in combination with a secondary reservoir under the pen.

6. A feed-bar of a fountain-pen beveled externally at and in front of the inner end so as to form a capillary channel or passage-way for ink from the reservoir, substantially in the manner and for the purpose set forth, in combination with capillary channels or passage-ways for transferring the ink from the reservoir to the pen, both walls of which are formed in the body of the feed-bar, in combination with a secondary reservoir under the pen.

7. An annular capillary channel or passage-way for ink from the reservoir located at and in front of the inner end of the feed-bar of a fountain-pen in a position to take the ink directly from the inner wall of the reservoir around its whole circumference and from the bottom end and lower side of the reservoir and conduct it to capillary fissures formed in the body of the feed-bar, to further conduct it on the way to the writing-pen, substantially in the manner and for the purpose set forth.

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Witnesses:

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