

RESERVE COPY
PATENT SPECIFICATION

620,605



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Index at acceptance:—Class 146(iii), A9e4, A11(a: d1: d2: g).

COMPLETE SPECIFICATION

Improvements in and relating to Fountain Pens

I, JOHN JAMES VICTOR ARMSTRONG, Chartered Patent Agent, of 12, Church Street, Liverpool, in the County of Lancashire, Subject of the King of Great Britain, do hereby declare the nature of this invention which has been communicated to be by Scripto Incorporated, a Corporation organised under the laws of the State of Georgia, United States of America, of 423, Houston Street, N.E. Atlanta, in the State of Georgia, United States of America, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to fountain pens and has as an object the provision of a pen made up of parts of extreme simplicity.

Further objects of the invention are to provide a pen the parts of which are so shaped as to be capable of being all formed of molded plastic material; to provide an improved ink feed having ample storage for any ink in excess of that required at the moment; to provide security against blotting by delivery of ink not required for writing; and to provide a feed-bar-supporting nib.

According to the present invention a fountain pen has a barrel including a feed portion or section and a reservoir portion or section in which a feed bar, supported in the feed section and having a nib on its outer end, is formed so that a portion of the length of the inner surface of the feed section is spaced from a corresponding length of the surface of the feed bar to provide an annular excess ink storage space of capillary dimensions and has one or more ink supply ducts extending from the reservoir section to a position adjacent the point of the nib and freely opening into said ink storage space which is provided with an air vent to the reservoir section.

The invention will be further described by way of example with reference to the accompanying drawings showing an illustrative embodiment of the invention and wherein:

Figure 1 is a detail central section of the writing end of a pen showing the feed arrangement and drawn to an enlarged scale;

Figures 2 to 5 inclusive are vertical transverse sections on the corresponding section lines of Figure 1;

Figure 6 is a plan view of a convenient form of nib.

Figure 7 is a view corresponding to Figure 1 showing an embodiment of the invention differing in details from that of Figure 1; and

Figures 8 to 11 inclusive are vertical transverse sections on the corresponding section lines of Figure 7.

As shown, the device comprises a barrel having a feed section 10 and a reservoir section 11. The invention is not concerned with the method of filling the pen and, therefore, the whole of the reservoir section is not shown. The reservoir section is shown as mounted upon the feed section at the screw-threaded portions 12 of the two. Prior to the placing of the reservoir section a pen cap receiving sleeve 13 is shown as screwed upon the screw threads 12 which sleeve abuts with a shoulder 14 on the feed section.

The section 10 is formed interiorly with an internally frusto-conical surface 15 in which seats a complementarily formed portion of a feed bar 16. The feed bar is formed with an opening to receive a vent pipe 17 which desirably extends to a point near the upper end of the reservoir section of the barrel, and the interior of said pipe forms a continuation of a bore 18 communicating with a cross bar 19 opening to the surface of the feed bar. From end of the frusto-conical portion of the feed bar the bar is of reduced size and preferably tapers to end 21 of a solid portion thereof from which projects a nib-receiving portion 22 of the bar.

To feed ink from the reservoir portion of the barrel to the nib, capillary passages 23 are provided, which passages in the form shown are three in number and which, or at least the central one thereof,

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terminates at point 24 adjacent the forward end of the feed bar. To provide storage for ink in excess of that required at any particular time of writing an annular chamber is provided in the form of a space 25 which is formed by formation of the interior of the feed-section of the barrel of larger diameter than the exterior of the feed bar.

To admit air to the pen an opening of considerable size is provided within end 26 of the feed section of the pen below a flattened lower surface 27 of the nib-receiving portion of the pen and air passing to the reservoir flows along the lower portion of the space 25 to enter the cross bore 19 at 36 where a portion of the bore opening is exposed by the reduced diameter occurring at the plane 20 whereat the frusto-conical portion of the feed bar terminates.

The storage space for excess ink at 25 is formed of capillary size so that ink therein will not flow therefrom by gravity, which ink will only be fed out of this storage space as it flows to the writing end of the nib by means of the passages 23. It will, therefore, be seen that presence of ink in the space 25 will prevent access of air to the vent pipe 17 and therefore an added supply of ink cannot leave the reservoir until the ink in the storage space is exhausted. To support the forward end of the feed bar it is convenient to provide a special form of nib. This form of nib comprises a pair of arcuate wings 28, 29 and a second pair of wings 30, 31 which are struck from the material of the nib in its formation. The wings 28, 29 bearing upon the interior of the feed section support the nib which in turn by means of wings 30, 31 supports the feed bar in the storage space 25 and prevents possible breakage of the reduced end of the same.

The nib as shown, in addition to the wings referred to, comprises an arcuate portion 32 riding upon the top of the feed bar with a perforation 33 of normal type and slit 34 formed therein. The feed bar therefore, except for the opening receiving the vent pipe 17 and the portions 18 and 19, and with the exception of the capillary passages 23, is a solid body. All the described portions of the pen are such as to be readily molded from a synthetic plastic by the injection molding method. The opening within the arcuate wings 28, 29 at the forward end of the feed section is ample for air supply, and the extreme simplicity of the parts is readily apparent.

In the form of the invention shown in Figures 7 to 11 inclusive feed section 10¹ and reservoir section 11¹ are shown as formed integrally. To coact with a pen cap not shown, a band 13¹ is shown seated

in a recess in the periphery of the barrel, which band may be swaged into the recess or placed in any other desired manner.

In this form of the invention the vent pipe 17 and the bores 18 and 19 are omitted. To vent air into the reservoir section a shallow channel 37 is provided in the frusto-conical enlarged portion of feed bar 16¹, through which channel air may pass to the reservoir over the ink flowing to the nib by way of channel or channels 23¹.

In this form of the invention also the wings 28, 29 of Figures 1 and 6 are omitted and wings 30¹, 31¹ are extended to a point adjacent end 26¹ of the barrel of the pen. To support the nib carrying portion of the feed bar and to center the central portion thereof the thickness of the front end of the feed bar plus that of the nib and wings is such as to bear in the opening of the barrel below its horizontal diameter as seen in Figure 8.

In operation of the described structure, ink from the reservoir 11 flows to the writing point through the passages 23. Since the air vent is open to the atmosphere at 26¹ Figure 7 and correspondingly in Figure 1, ink will continue to flow from the reservoir 11 or 11¹ into the passages 23 or 23¹ to the end 20 or 20¹ of the storage space 25 or 25¹ until a film of ink is formed over the air vent opening 36 or 37. When either of these openings is closed ink will stop flowing because no more air can be admitted to the reservoir 11 until the ink film blocking the opening has been broken by a demand for ink at the writing point.

Should the air on top of the ink in the reservoir 11 be unduly heated by body temperature or by other outside causes, the increase in pressure will force an excessive amount of ink from the reservoir 11 by way of the passages 23, filling the storage space 25, from the end 20 toward the end 21 since the width of this space 25 increases gradually from the end 20 to the end 21. If the storage space 25 is filled or partially filled, when writing with the pen the ink in this space 25 must first be used before additional ink can flow from the reservoir 11 because the air vent is blocked at 36 or 37.

The passages 23 are open at one side to the space 25 throughout its length from end 20 to end 21. However, as can be seen by those skilled in the art, ink will not flow from these passages 23 into space 25 without an increase in pressure on the air above the ink supply in the reservoir 11. This flow is prevented by the edge effect since the width of the space 25 at the end 20 is greater than the width of the passages 23.

As ink is used from the passages 23 in

writing, any ink in the space 25 will enter the finer capillary passages 23 and flow to the writing point until the air vent is opened at 36 or 37. Then air is admitted to the reservoir 11, and a new ink supply flows through passages 23 and into the space 25 until the opening is again blocked.

Minor changes may be made in the physical embodiments of the invention within the scope of the appended claims.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, as communicated to me by my foreign correspondents, I declare that what I claim is:—

1. A fountain pen having a barrel including a feed portion or section and a reservoir portion or section in which a feed bar, supported in the feed section and having a nib on its outer end, is formed so that a portion of the length of the inner surface of the feed section is spaced from a corresponding length of the surface of the feed bar to provide an annular excess ink storage space of capillary dimensions and has one or more ink supply ducts extending from the reservoir section to a position adjacent the point of the nib and freely opening into said ink storage space which is provided with an air vent to the reservoir section.

2. A fountain pen as claimed in claim 1 in which the feed section which may be formed integral with the reservoir section or as a separate element screwed to the reservoir section, has an internal frusto-conical seat at or adjacent its reservoir end which receives a complementarily formed seat at the inner or reservoir end of the feed bar.

3. A fountain pen as claimed in claim 1 or 2 in which the said ink supply duct or ducts freely open into said storage space throughout the length of the storage space.

4. A fountain pen as claimed in claim 1, 2 or 3 in which the air vent opens from said ink storage space at a point closely adjacent the portion thereof nearest the reservoir.

5. A fountain pen as claimed in claim 1, 2, 3 or 4 in which the air vent delivers the air to the space in the reservoir at a position remote from the duct or ducts opening thereunto.

6. A fountain pen as claimed in any of the preceding claims in which the ink storage space is of reduced transverse dimensions towards the ink reservoir.

7. A fountain pen as claimed in any of the preceding claims in which the feed bar is formed with an enlarged end portion rigidly seated in the end of the feed section

adjacent the reservoir section, an intermediate portion of reduced diameter, the periphery of which is spaced from the interior of the feed section to provide said excess-ink storage space of capillary dimensions, and a still further reduced nib carrying portion projecting through the writing end of the feed section and spaced from a portion of the feed section to admit vent air.

8. A fountain pen as claimed in claim 7 in which the interior of the portion of the feed section surrounding the nib carrying portion of the feed bar is substantially reduced in diameter from that of the ink storage space.

9. A fountain pen as claimed in any of the preceding claims in which the nib is formed with means for holding the outer end or nib receiving portion of the feed bar in normal radial position relative to the outer end of the feed section.

10. A fountain pen as claimed in any of the preceding claims in which the nib is formed with portions or lugs underlying the outer end or nib receiving portion of the feed bar to provide rigid engagement therewith and to assist in maintaining the normal relative positions of the feed bar and feed section.

11. A fountain pen as claimed in claim 10 in which the underlying portions or lugs of the nib are in the nature of wings bent from the material of the nib.

12. A fountain pen as claimed in claim 7 in which the feed bar is formed with an air vent bore through said enlarged end portion and a cross bore extending from said vent bore and opening into said ink storage space.

13. A fountain pen comprising a barrel interiorly formed to provide an ink reservoir chamber and an excess-ink storage space or chamber, a feed bar of which a portion thereof is seated in the barrel between said chambers and thereby separates the same, and a second portion of which is formed with ink supply duct means and with its surface otherwise uninterrupted and spaced from the inner surface of said storage chamber to restrict said storage chamber to capillary dimensions, said barrel being formed with a hollow writing end portion of reduced inner diameter opening into said storage chamber and through which an end portion of said feed bar projects, a nib mounted between said bar and barrel end portions and air vent means connecting said chambers.

14. In a fountain pen, in combination: a barrel comprising a reservoir section and a feed section; the interior of said barrel formed with a substantially cylindrical reservoir space, a frusto-conical feed bar

seat, a substantially cylindrical feed bar enclosing chamber of less diameter than said reservoir space and a still further reduced substantially cylindrical nib receiving space; a feed bar having a head supported in said seat, a tapering portion with its surface spaced from the wall of said chamber to provide an ink storage space of capillary dimensions and a nib carrying portion partially filling said nib receiving space; and a nib carried by said latter portion.

15. A fountain pen as particularly described with reference to the accompanying Figures 1 to 6.

16. A fountain pen as particularly described with reference to the accompanying Figures 7 to 11.

Dated this 12th day of September, 1946.

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Chartered Patent Agents.

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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

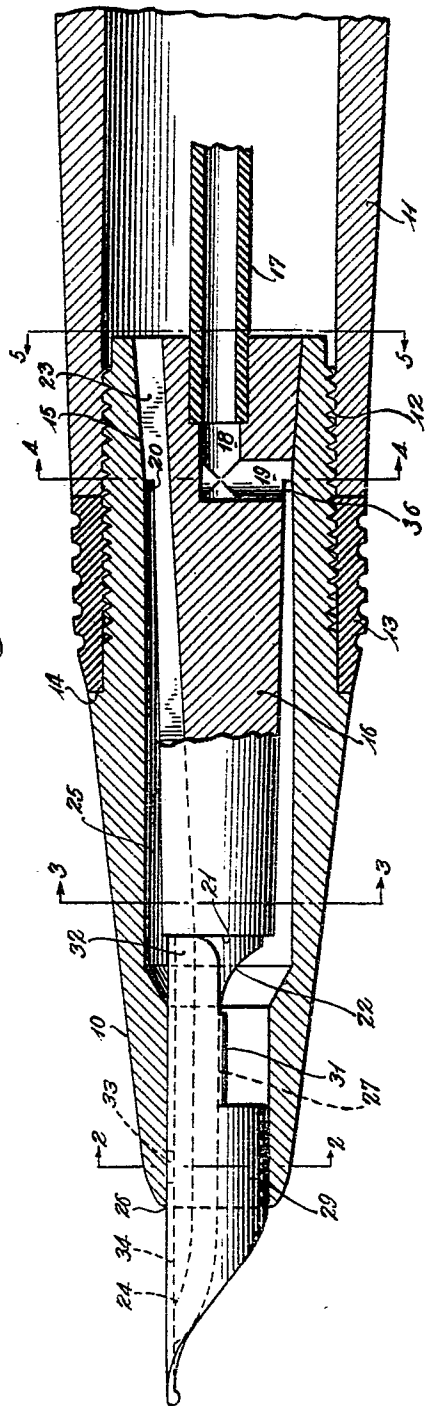


Fig. 3.

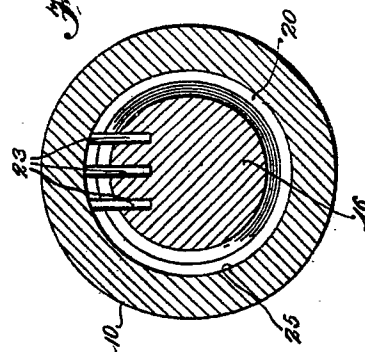
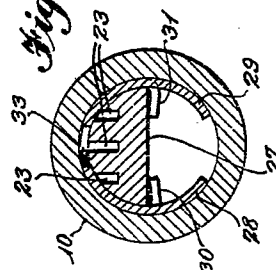
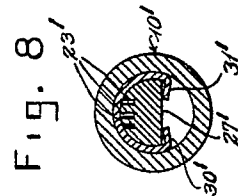
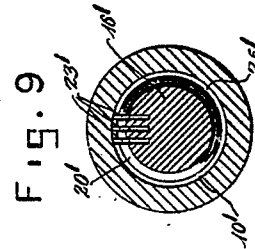
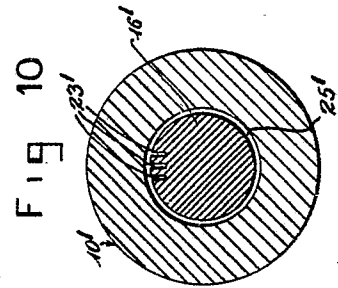
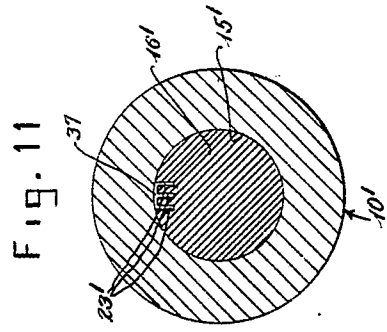
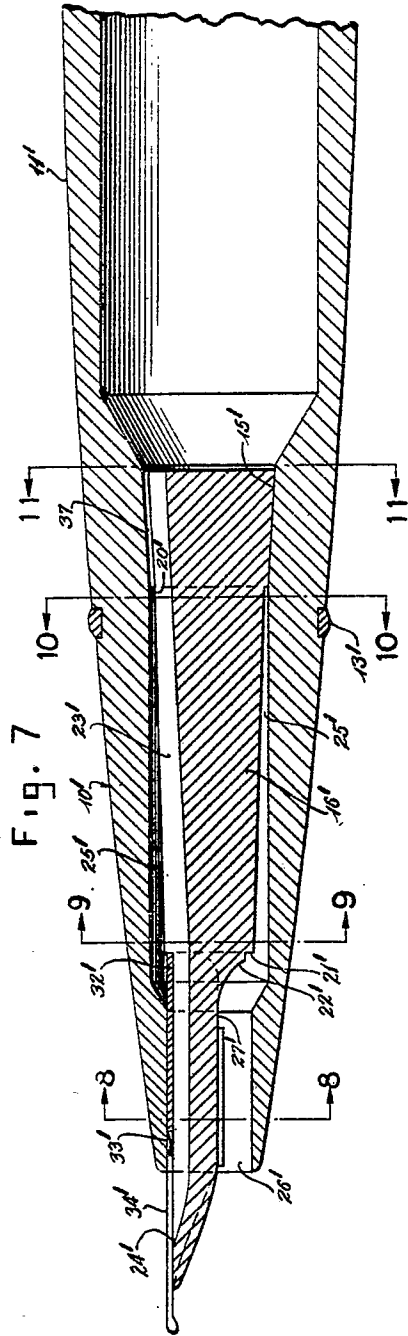
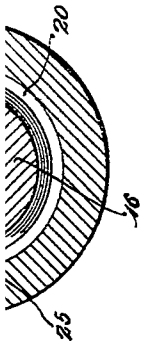
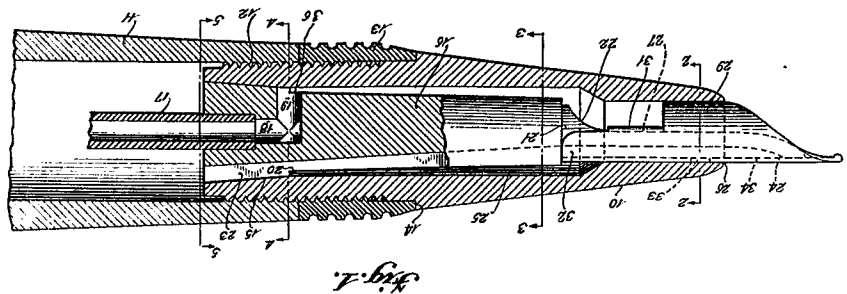
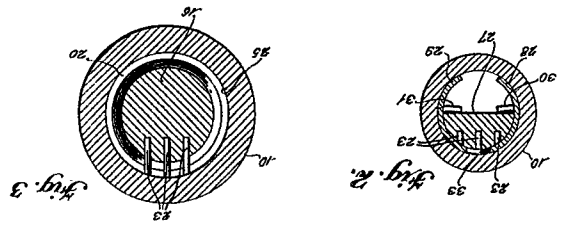
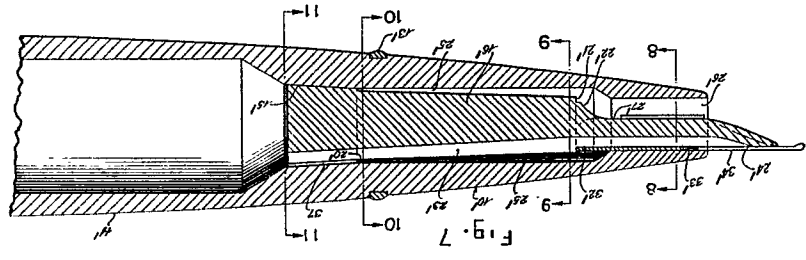
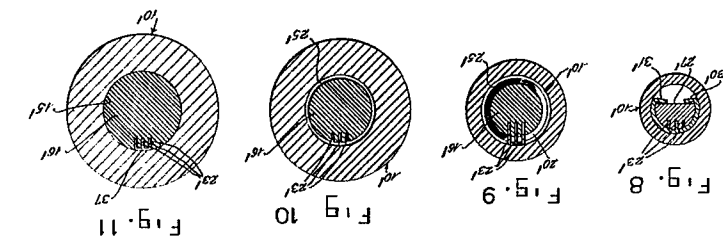


Fig. 2.







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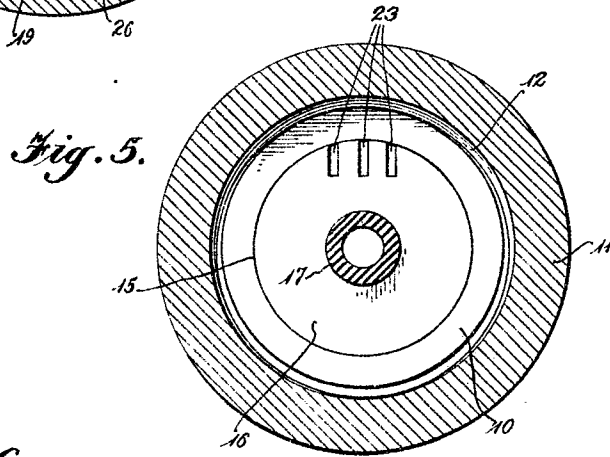
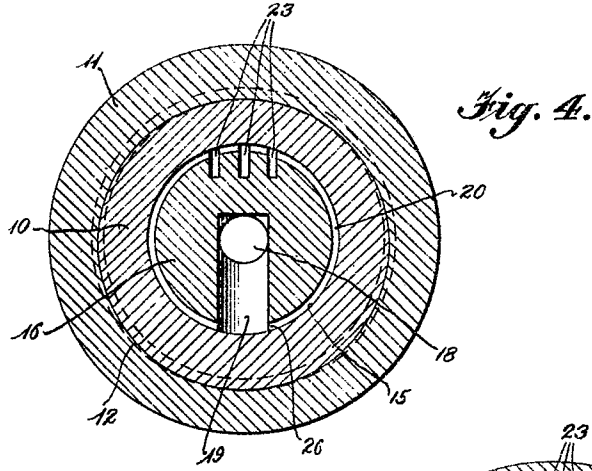


Fig. 6.

