June 18, 1935. F. B. CHAMBERLIN 2,005,179

FOUNTAIN PEN

Filed May 6, 1933

Fig. 1.

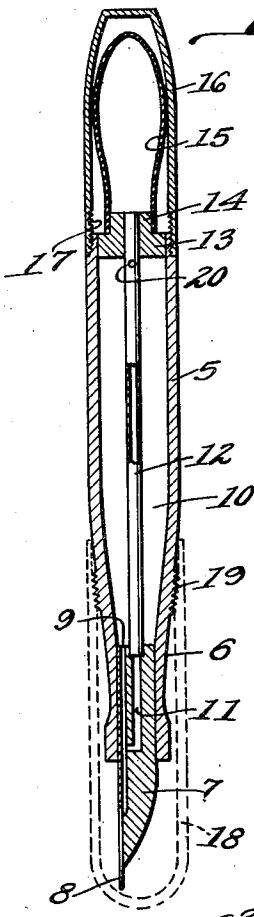


Fig. 2.

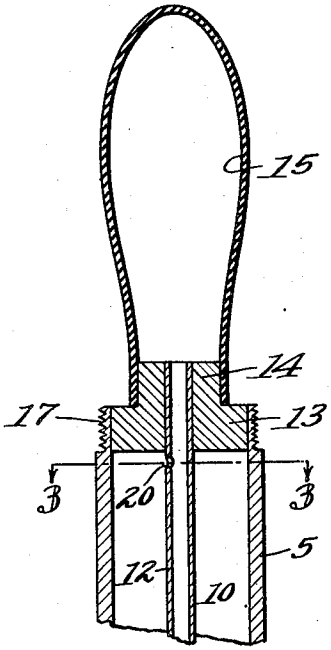


Fig. 3.

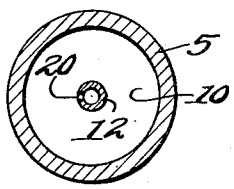
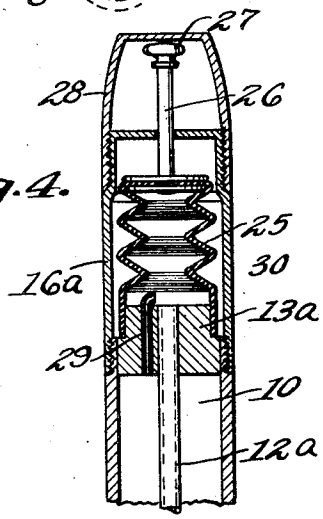


Fig. 4.



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FOUNTAIN PEN

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Application May 6, 1933, Serial No. 669,730

1 Claim. (Cl. 120—46)

This invention relates to fountain pens, and more particularly to fountain pens of the so-called self-filling type, which are adapted to be filled with ink without involving the use of separate filling appliances, and among the objects of the invention are to simplify the construction of such a pen, to eliminate the use of movable parts therein such as valves and the like, which are apt to stick and become out of order, and to provide a pen which in proportion to its outside dimensions is capable of holding a relatively large supply of ink with each filling thereof.

With these and other objects in view, which will appear as the description proceeds, the invention consists in the novel features of construction, combination of elements and arrangements of parts hereinafter fully described and pointed out in the appended claim.

In the accompanying drawing:

Fig. 1 is a longitudinal sectional view taken through a fountain pen formed in accordance with the present invention;

Fig. 2 is a similar view on an enlarged scale of the upper or bulb end of the pen;

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view of a modified form of pen.

The pen as shown in Figs. 1 to 3 comprises a barrel 5, the lower end of which is provided with a neck or finger portion 6 of somewhat reduced diameter as compared with the main body portion of the barrel. Within the open lower end of the barrel there is inserted and suitably retained a feed bar 7 and a pen point 8.

The feed bar, adjacent to the pen point, is provided with a vertically extending passage 9 by which ink flow from the ink reservoir 10 of the barrel to the pen point is effected. Communicating with the passage 9 and formed in the feed bar is a laterally disposed port 11, the upper end of which communicates with an air displacement tube 12 disposed axially and longitudinally within the barrel 5. The lower end of the tube 12 is preferably received within a socket formed in the upper end of the feed bar 7 in registration with the port 11, while the upper end of the tube 12 is mounted in a closure member 13 formed at the upper end of the barrel 5 and rigidly retained in any suitable manner in connection therewith. The closure member 13 includes, on its upper surface, an upstanding boss 14, with which is connected the open lower end of the collapsible bulb 15, which may be made of rubber or other suitable material. Normally, the bulb 15 is protected by a shell 16 which is threaded as at 17 to the upper end of the barrel 5, which permits of the removal of the shell during the filling of the pen with ink in order to provide convenient access to the bulb 15. The pen point 8 may be protected by the employment of the removable cap section 18 which is adapted to be connected with the barrel by means of threads 19 in order to cover the pen point when the latter is not in use. This cap section during the use of the pen may be positioned on the shell 16 in the customary manner. The tube 12 is provided within the confines of the reservoir 10 and immediately adjacent to the closure member 14 with a restricted opening 20 of considerably smaller diameter than the longitudinal opening in the tube 12, the axis of the opening 20 being preferably arranged at substantially right angles to the longitudinal axis of the tube.

In the filling of the reservoir 10 with ink, the shell 16 is first removed which enables the bulb 15 to be collapsed by finger pressure to effect an expulsion of air from within the bulb. The air thus displaced from the bulb travels downwardly through the tube 12, thence through the port 11 into the passage 9 and is discharged into the body of ink in which the pen point is immersed. Due to the fact that the opening 20 is of very restricted diameter and is disposed substantially at right angles to the direction of flow of air through the tube 12, by far the greater proportion of air displaced from the bulb is discharged through the lower end of the pen and does not find access into the reservoir 10 through the opening 20. Upon the release of the bulb and its subsequent expansion, a partial vacuum is produced therein so that air pressure upon the body of ink in which the pen point is immersed causes such ink to travel upwardly through the passage 9 and thence into the reservoir 10, although a substantially equivalent rise of ink takes place in the tube 12. This operation may be repeated, i. e., the collapsing and expansion of the bulb 15 until the desired amount of ink has been drawn into the reservoir, and the shell 16 may then be replaced and the pen used in the ordinary manner. It will be noted that this construction avoids completely the use of small movable members such as valves and controlling means therefor and in this respect the present invention constitutes an improvement upon the construction disclosed in my prior Patent No. 1,787,896 dated January 6, 1931, not only in the matter of simplifying the construction but in rendering the operation more positive and reliable, since such small movable parts are apt to

corrode, stick, break or become out of order following some use thereof.

A slightly modified form of the invention has been disclosed in Fig. 4 wherein a collapsible bulb 25 of the accordion type is secured to the upper end of a closure member 13*a*, and is arranged within a shell 16*a*. The upper end of the bulb 25 is connected with a plunger 26 which is adapted to slide in a bearing formed in connection with the upper wall of the shell 16*a*. The end of the plunger which projects beyond the shell 16*a* is provided with an operating knob 27, normally disposed in a removable cap piece 28 carried by the upper portion of the shell 16*a*. Also, in this form of the invention, instead of forming the tube 12*a* with an opening as indicated at 20 in the preferred form of the invention, the closure member 13*a* is formed with a small tube 29 having its upper end terminated in a right angularly bent portion 30, arranged within the confines of the bulb 25. The principles of operation of this modified form of the invention are precisely the same as that found in the preferred form, in that owing to the relatively small diameter of the tube 29 and to its right angularly bent portion 30, air displaced from the bulb rapidly passes through the tube 12*a* instead of entering the upper portion of the ink reservoir. The diameter of the tube 29 is sufficiently large however to vent the upper region of the ink reservoir and to allow for the gradual rise of ink in said reservoir by the repeated expansion and collapsing of the bulb without air compression. It will be understood that the several constructions herein shown and described are subject to some variation or modification without departing from the scope of the invention as the latter has been defined in the following claim.

What is claimed is:

A fountain pen comprising a barrel provided with an internal ink reservoir, a ported feed bar formed in connection with the lower end of said barrel, the ports in said feed bar establishing communication for fluid flow between said ink reservoir and the atmosphere, a closure formed at the upper end of said ink reservoir, a bulb carried by said closure, and a tube extending longitudinally of said barrel and establishing fluid flow between the interior of said bulb and the ports of said feed bar, said tube adjacent to said closure being provided with a restricted, valveless opening possessing a diameter materially less than that of said tube, the axis of said opening being disposed substantially at right angles to the longitudinal axis of the tube.

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