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FOUNTAIN PEN

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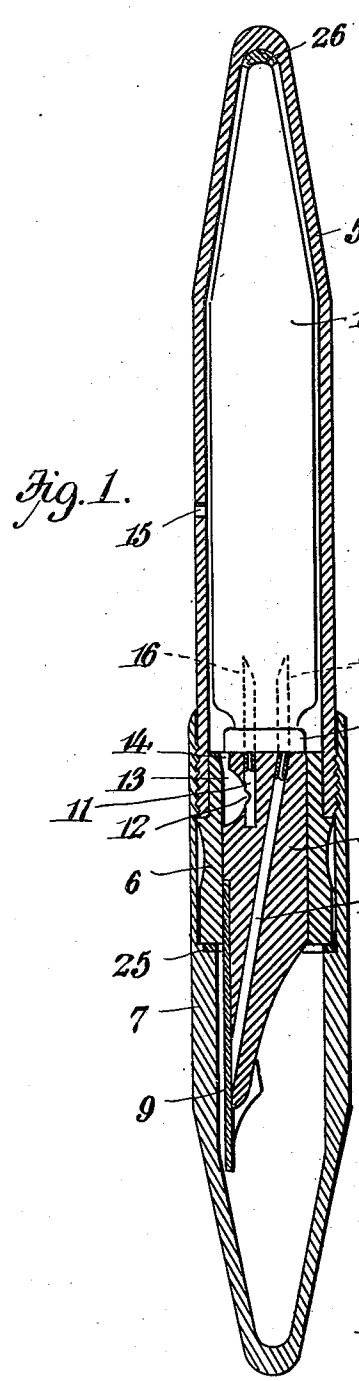

Fig. 1.

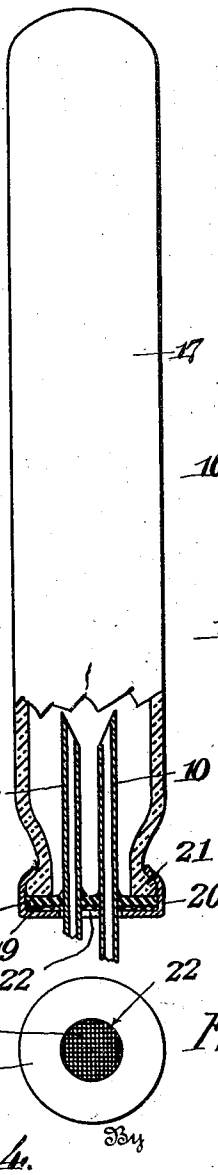

Fig. 3.

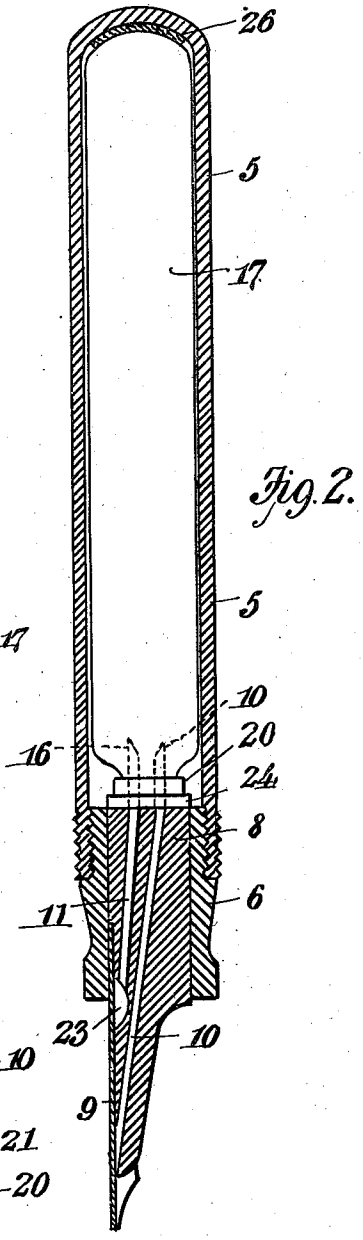

Fig. 2.

Fig. 4.

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FOUNTAIN PEN

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6 Claims. (Cl. 120—42)

This invention relates generally to fountain pens, and particularly to that type of fountain pen employing ink-filled cartridges to supply the writing fluid.

An object of the invention is to provide a fountain pen of such construction that the cartridge containing the ink supply may be quickly and easily applied to the pen and so assembled therewith as to insure at all times a proper and even supply of ink to the pen point.

A further object of the invention is to provide a fountain pen of such construction that danger of over feed of ink to the pen is precluded, and which has its parts so constructed and arranged as to entirely eliminate the possibility of clogging of the ink passage or leaking of the ink cartridge.

A further object of the invention is to provide a fountain pen of the character generally stated, wherein a filled ink cartridge may be easily and quickly applied to the pen without the exercise of special skill or instruments, and wherein a leak-proof seal between the cartridge and the pen head is effected.

Further objects reside in the specific construction of a puncturable closure member for the cartridge, as well as the specific construction and arrangement of ink and air feed tubes in the pen head for cooperation with the ink cartridge in the production of a fountain pen possessing a high degree of efficiency and practicability.

With these objects in view, together with others which will appear as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawing, and particularly pointed out in the claims.

In the drawing:

Figure 1 is a central longitudinal sectional view taken through a fountain pen, upon an enlarged scale, embodying the invention.

Figure 2 is a similar view showing a modified form of the invention.

Figure 3 is a detail side elevation, parts in section, showing the manner in which the ink and air tubes penetrate the improved closure cap for the cartridge, and

Figure 4 is a bottom plan view of the reservoir as shown in Figure 3.

Referring now more particularly to the drawing, 5 represents a pen barrel of generally cylindrical form, having a removable pen carrying head 6 at one end and the usual internally threaded cap 7 to enclose the said head when the pen is not in use. The shape, assemblage, and construction of these parts may take any desired form.

The head 6 is provided, as usual, with a plug 8 fitting snugly therein and carrying the usual pen point 9. In accordance with the present invention, this plug has arranged therein an ink tube or duct 10, one end of which opens beneath and in ink feeding relationship with the pen point as shown, while the opposite end projects beyond the corresponding end of the plug near the axis thereof. The projecting end of this tube is angularly formed as shown to provide a sharpened or penetrating point.

The plug 8 also contains an air supply duct or tube 11, which tube is secured within the plug and is provided near its lower end with a port 12 in communication with an air pocket or chamber 13 formed in the plug. This air pocket communicates with the interior of the barrel by means of a passage 14, and the interior of the barrel is in communication with atmosphere by means of a port or passage 15. The projecting end 16 of the air tube is also angularly cut to provide a penetrating point.

The ink supply for the pen includes a cartridge 17 of a size and shape to correspond substantially with the interior of the barrel and for convenient accommodation therein. This cartridge may be formed of metal, glass, or other desired materials, it being preferred that such materials be transparent in order that the contents may be visible from the exterior. The cartridge is permanently closed at one end, and has a puncturable closure at its opposite end. This closure includes a diaphragm or disc of rubber indicated at 18, reinforced preferably by a cloth disc 19. The rubber and cloth discs may be cemented, vulcanized, or in any other preferred manner permanently secured together, and are of a diameter sufficient to entirely close the otherwise open end of the cartridge. The rubber and cloth discs are securely held upon the open end of the container by a thin metallic cap 20, the edges of which may be crimped around a neck 21 at the end of the cartridge. This cap is provided with a relatively large central opening 22, the size of which is sufficient to permit of the entry of the projecting ends 10 and 16 of the ink and air tubes.

Figure 2 of the drawing discloses a slightly modified form of the invention, wherein the

pocket 23 to supply air to the tube 11 is located beneath the pen point 9 and obtains its supply of air from around the edges of the said point instead of from the interior of the barrel 5. This form of the invention includes a rubber gasket 24 interposed between the cartridge and the plug 8, to constitute an additional liquid seal should such be required.

Figure 1 of the drawing shows a gasket 25 interposed between the closure cap 7 and the head 6 for sealing purposes, as will be understood.

From the foregoing it is apparent that when it is desired to "fill" the pen for writing purposes, it is but necessary to apply the proper end of a filled cartridge 17 to the base of the plug 8 in the manner shown. The central opening 22 of the metal cap 20 will be sufficiently large to receive the adjacent tube ends 10—16, in fact this opening 22 will assist the operator in properly centering the cartridge upon the plug. Due to the sharpened ends of the tubes 10—16, only slight pressure will be required to cause penetration of the fabric and rubber diaphragms, whereupon the plug and cartridge are moved together until the cap 20 rests upon the base of the plug. The rubber constituting the diaphragm 18 will snugly engage the sides of the tubes 10—16 and leakage will be prevented. In the writing operation, ink will flow through the long tube 10 and will be liberated beneath and adjacent to the pen point while air will enter the cartridge 17 through the tube 11 and permit of a steady and even flow of the ink to the pen point. The openings within these tubes may be of such size as will permit an even flow of ink with a minimum of opportunity for clogging. The operation of the modification shown in Figure 2 is precisely the same, as air will be supplied to the pocket 23 of the plug beneath the pen point 9.

In order to firmly hold the reservoir or cartridge 17 within the barrel 5, a pad 26 may be arranged in the closed end of the barrel, against which the end of the cartridge will engage.

From the foregoing it is apparent that I have constructed a pen which is fully capable of accomplishing the several results set forth. The size and arrangement of the ink and air passages is such as to preclude the possibility of overfeed or flooding. The feed of ink through the extremely small tube 10 during the writing operation is brought about by capillary attraction.

While the foregoing is a description of the preferred embodiments of the invention, it is obvious that variations in the construction and arrangement of parts may be resorted to without departing from the spirit of invention as defined by the claims.

Having thus described my invention, what I claim as new and useful is:

1. In a fountain pen, a head, a pen carried by said head, an ink holder, a puncturable closure for said holder, an ink tube in said head communicating at one end with said pen and having its opposite end projecting beyond said head, an air vent comprising a tube secured in said head and having an end projecting beyond the latter, the projecting ends of said air and ink tubes adopted to penetrate said ink holder closure.

2. In a fountain pen, a head, a pen carried by said head, an ink tube in said head communicating at one end with said pen and projecting at its opposite end beyond said head, an air tube in said head projecting at one end beyond the latter, the opposite end of said air tube in communication with the atmosphere, and an ink holder having an end closed by a diaphragm through which said tube ends are adapted to pass.

3. In a fountain pen, a head, a pen carried by said head, an ink tube in said head, said tube communicating at one end with said pen and projecting at its opposite end beyond said head, an air tube in said head having one end communicating with atmosphere and its opposite end projecting beyond said head adjacent to said ink tube end, an ink holder, and a puncturable diaphragm closing one end of said holder and adapted to be penetrated by said air and ink tube ends.

4. In a fountain pen, a stock, a pen plug engaged in said stock, an ink tube extending through said plug and communicating at one end with said pen, the opposite end of said ink tube projecting beyond the end of said plug, said plug having an air passage, an air tube in said plug having one end communicating with said passage and its opposite end projecting beyond said plug adjacent to and parallel to said ink tube end, an ink holder having an end closed by a puncturable diaphragm, said diaphragm adapted to be penetrated by said air and ink tube ends, and a barrel enclosing said holder.

5. In a fountain pen, a head, ink and air tubes projecting beyond one end of said head in spaced parallel relation and substantially in the axis of said head, an ink holder having one end permanently closed, a puncturable diaphragm closing the opposite end of said holder, and a centrally apertured metal cap holding said diaphragm securely upon said ink holder, said aperture of a size to receive the said air and ink tube ends.

6. In a fountain pen, a head, a pen carried by said head, an ink tube extending through said head, one end of said tube communicating with said pen and projecting at its opposite end beyond said head, said head having an air chamber disposed beneath said pen, an air tube in said head communicating at one end with said chamber and projecting at its opposite end beyond said head, and an ink cartridge having an end closed by a puncturable diaphragm adapted to receive the projecting ends of said ink and air tubes.

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