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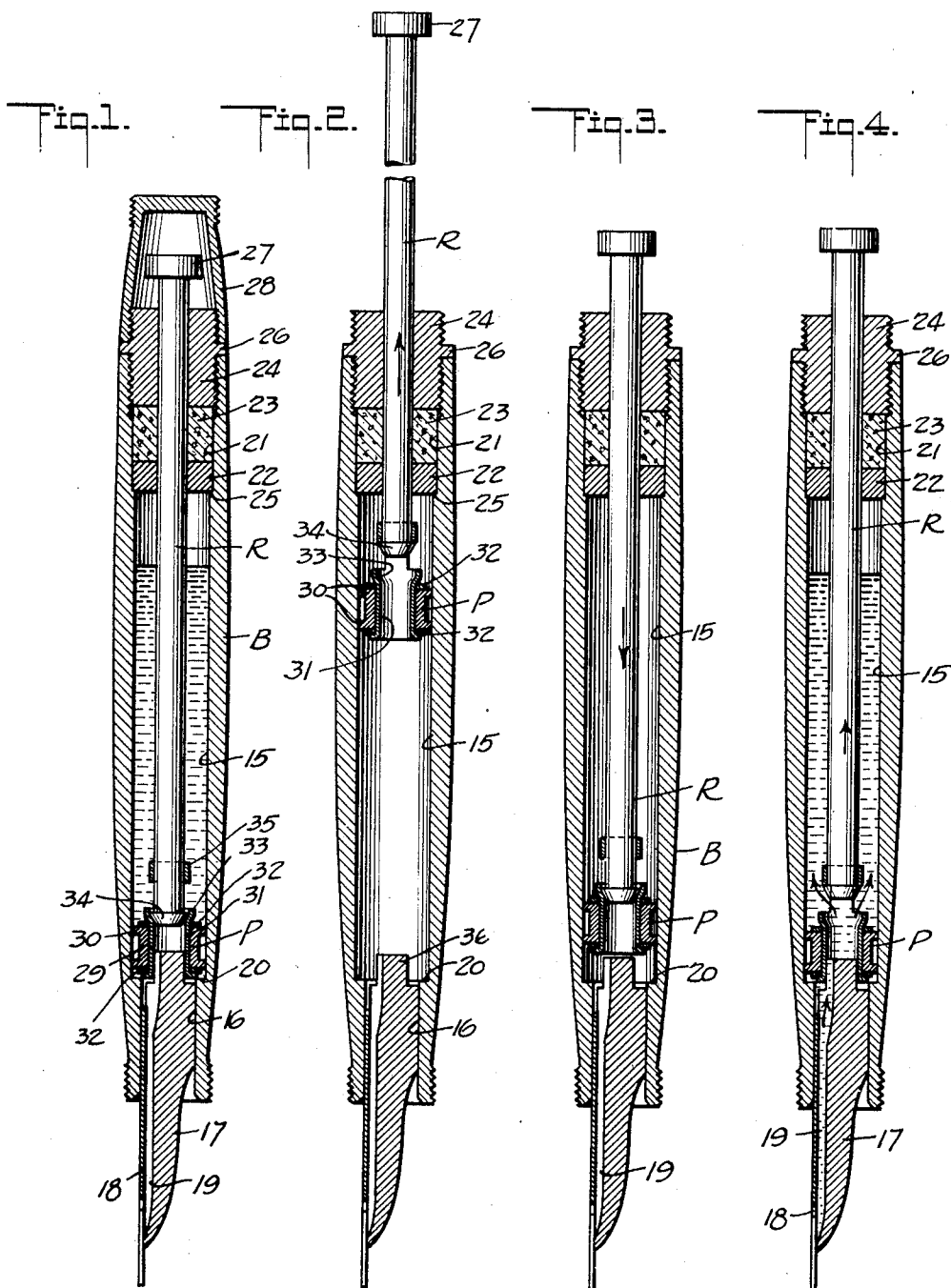
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FOUNTAIN PEN

Filed Nov. 29, 1926

2 Sheets-Sheet 1



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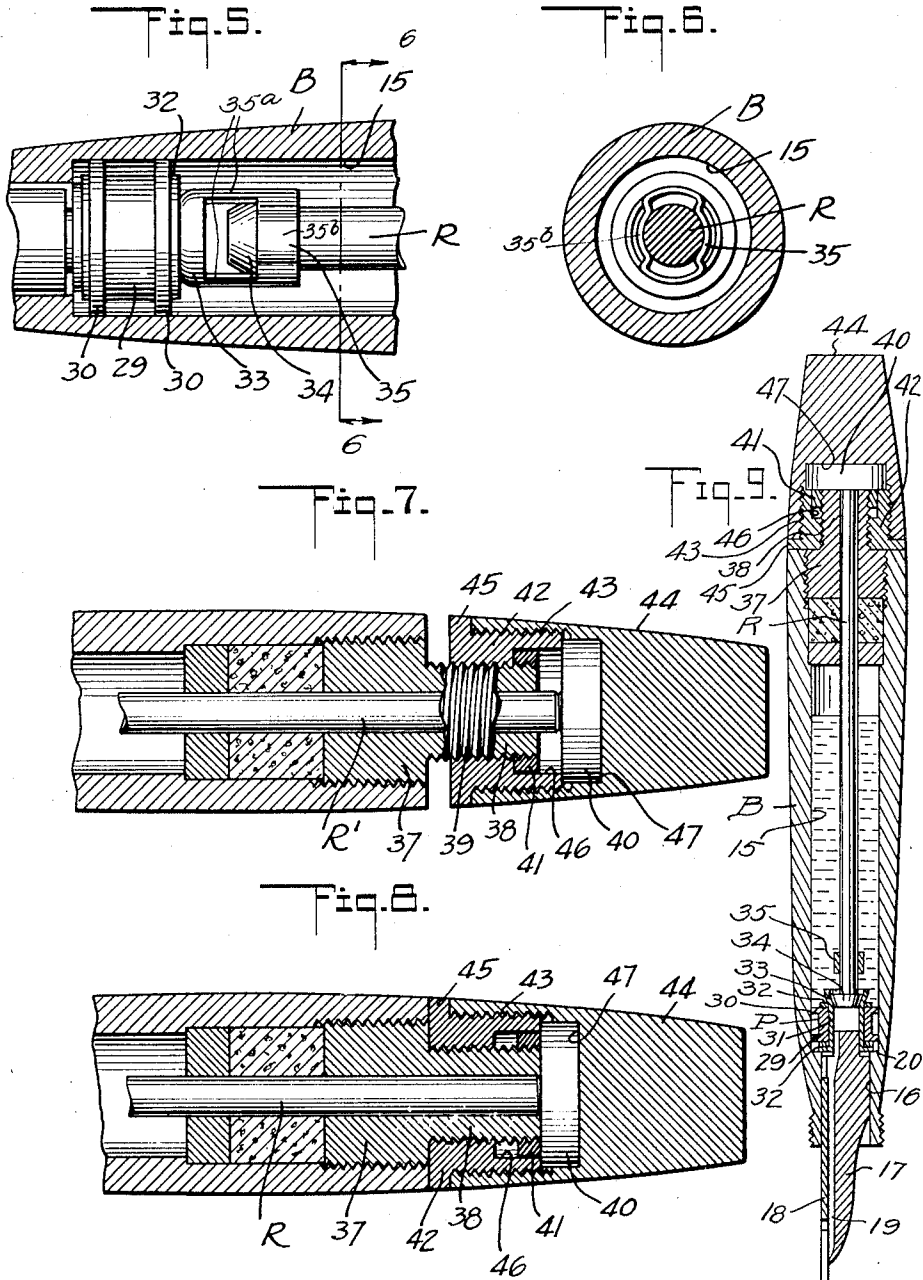
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# UNITED STATES PATENT OFFICE.

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## FOUNTAIN PEN.

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Our invention relates to fountain pens of the character employing a plunger which is operable in an ink barrel to fill the latter with ink by means of suction.

5 It is a purpose of our invention to provide a fountain pen of the above described character which simplifies the structure and operation of similar pens to the extent of permitting such pens to be manufactured at a  
10 relatively low cost, providing a pen of much more substantial construction, and a pen which is capable of being easily operated to quickly fill the pen barrel with ink by the creation of suction therein.

15 It is also a purpose of our invention to provide a fountain pen in which the plunger thereof can be effectively sealed when the pen is not in use to prevent the possibility of leakage of ink from the barrel.

20 A further purpose of our invention is the provision of a fountain pen having a cap covering the plunger rod and which is associated therewith to permit actuation of the plunger valve to open or seal the ink barrel, thereby eliminating the necessity of removing the cap each time the pen is opened for use or closed for carrying.

25 We will describe only one form of fountain pen embodying our invention, and will then point out the novel features thereof in claims.

In the drawings

30 Figure 1 is a view showing in vertical longitudinal section one form of fountain pen embodying our invention, with the ink barrel filled and the plunger thereof sealed against delivery of ink to the nib;

35 Figures 2, 3 and 4 are views similar to Figure 1, showing other positions of the plunger in effecting the filling of the ink barrel;

40 Figure 5 is an enlarged fragmentary sectional view showing the plunger of the pen in side elevation;

45 Figure 6 is a view taken on the line 6—6 of Figure 5;

Figure 7 is an enlarged fragmentary sectional view showing a modified form of fountain pen embodying our invention;

50 Figure 8 is a view similar to Figure 7, showing another position of the pen shown in Figure 7, and

55 Figure 9 is a vertical longitudinal sectional view showing the modified form of fountain pen embodying our invention.

Similar reference characters refer to similar parts in each of the several views.

Referring to Figure 1, B designates a barrel which is made of any suitable material, such as bakelite, in order that it may be transparent so that the ink content of the barrel can be at all times observed. The barrel has a bore 15 constituting an ink chamber, and at one end of this chamber the bore is reduced as indicated at 16 in order to receive and frictionally retain therein an ink feeding spoon 17 and a conventional nib 18, the spoon being provided with an ink feeding duct 19 for delivering ink from the chamber 15 to the nib. At the junction of the bores 15 and 16 an annular shoulder 20 is formed, which provides an abutment against which a plunger, designated generally at P, is adapted to abut in its lowermost position. The upper end of the bore 15 is enlarged as indicated at 21 to receive a gasket 22, a packing plug 23, preferably formed of cork, and a screw plug 24, these elements constituting a closure for the upper end of the chamber 15. At the junction of the bores 15 and 21 is an annular shoulder 25 upon which the gasket 22 seats. The plug 24 is provided with an annular lip 26 which limits the inward screwing movement of the plug into the barrel. These elements, namely, the gasket, sealing plug and screw plug, are all provided with aligned openings through which the rod R of the plunger P is adapted to move, the outer end of the rod being provided with a head 27 which is adapted to be manually gripped in effecting the reciprocating of the rod, which is normally enclosed in a cap 28 threaded on the plug 24.

The plunger P comprises an annular body 29 formed of suitable material, and having its outer periphery grooved to provide spaced annular projections 30 which have sliding contact with the inner wall of the barrel. Extending through and secured in the body 29 is a tubular member 31 constructed to lock the body thereon through the employment of washers 32. The upper end of this member 31 is constructed to provide a valve seat 33 on which seats a valve 34 formed on the inner end of the plunger rod R. To provide an operative connection between the plunger and the rod and in a manner to allow relative movement of the two to permit the valve 34 to open or close

in respect to the passage the tubular member 31 is provided with a yoke 35 comprising spaced apart arms 35<sup>a</sup> terminating at their free end in a collar 35<sup>b</sup> which loosely  
5 embraces the rod at a point above the valve.

The feeding spoon 17 is provided at its upper end with a centrally disposed projection 36 of such diameter as to be slidably received in the tubular member 31. As illustrated, the feeding duct 19 extends upwardly into the extension 36, and with the plunger P in its lowermost position as shown in Figure 4, the extension functions to seal the tubular member in such manner that ink from the chamber 15 is only permitted to pass into the duct 19 and not beneath the plunger, thereby eliminating the possibility of ink accumulating between the plunger and the spoon when the parts of the pen are  
20 in the position shown in Figure 4.

In filling the pen it is of course necessary to first remove the cap 28 when the head 27 is exposed to permit it to be pulled upwardly, thereby imparting a corresponding  
25 movement to the plunger P, all as clearly illustrated in Figure 2. During this upward movement of the plunger the valve 34 occupies an open position so that air above the plunger is free to pass to the lower side thereof as the plunger moves upwardly. After the plunger rod has been moved upwardly to its greatest extent it is now pushed downwardly, and at the inception of this movement the valve 34 moves to closed  
35 position on the seat 33 so as to seal the plunger against air passing upwardly through the tubular member 31. Upon continued downward movement of the plunger rod the plunger is now moved downwardly, creating a partial vacuum in the chamber above the plunger. In the lowermost position of the plunger as illustrated in Figure 4, the extension 36 is seated within the tubular member 31, the plunger engaging the shoulder 20 and thus defining the lowermost  
45 position of the plunger. By inserting the nib, together with the spoon, into a bottle of ink and opening the valve 34 by an upward pull on the rod R, the vacuum created in the chamber 15 will function to draw ink into said chamber and rapidly fill the same, all as illustrated in Figure 4. Through the medium of the packing plug 23 the rod is retained in this elevated position so as to maintain the valve 34 open. Thus when the pen is in use ink is free to flow from the chamber 15 through the plunger and into the duct 19. When the pen is not in use the rod is pushed inwardly to close the valve 34, thereby sealing the plunger against the passage of ink therethrough and thereby sealing the pen against discharge of ink and thus rendering the pen nonleakable.

Referring now to Figures 7 and 8, we have here shown a modified form of foun-

tain pen designed to eliminate the necessity of removing the cap 28 each time it is desired to open or close a valve 34 incident to the use or non-use of the pen. In this embodiment of my invention I substitute for  
70 the screw plug 24 a screw plug 37 having an extension 38 projecting from the end of the pen barrel and exteriorly provided with left hand threads indicated at 39. The plunger rod indicated at R' is slidable in the plug 37  
75 and the extension 38, its outer end being provided with a relatively large disk shaped head 40. On the outer end of the extension 38 is a collar 41, while threaded on the extension is a member 42 provided exteriorly with  
80 right handed threads 43 to receive a cap 44. The inner end of the member 42 is formed with an annular shoulder 45 to limit the inward screwing movement of the cap thereon. The member 42 is provided with a pocket 46  
85 in which the collar 41 is received, and this pocket is of such diameter as to prevent the head 40 being received therein so that such head is interposed between the outer end of the member 42 and a pocket 47  
90 formed in the cap 44.

In Figure 7 we have shown the rod R' in a position corresponding to the rod R in Figure 4, in which the valve 34 is open, thus permitting ink to be delivered to the nib. If  
95 it is desired to move the rod R' inwardly to close the valve 34 and thus render the pen non-leakable the cap 44 is rotated in a counter-clockwise direction, causing the member 42 to be fed inwardly on the extension 38  
100 until the member 42 abuts the end of the pen barrel. During this movement the cap carries with it the head 40, thereby causing the rod to move inwardly to close the valve 34. Further rotation of the cap 44 unscrews it  
105 from the member 42 by virtue of the right hand threads 43 so that the head 40 is now uncovered to permit actuation of the plunger rod in effecting refilling of the pen. In reapplying the cap it is rotated on the member 42 in a clockwise direction until it strikes the shoulder 45.

From the foregoing operation it will be manifest that the plunger rod R' can, through manipulation of the cap 44, be  
115 moved to open or close the valve 34 without the necessity of actually removing the cap from the pen barrel.

Although we have herein shown and described only two forms of fountain pens embodying our invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of the invention, and the spirit and scope of the appended claims.

We claim:

1. In a fountain pen, a barrel having a plunger movable therein, said plunger comprising an annular body, a tubular member extending through the body and having one  
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end constructed to provide a seat, a yoke on the tubular body and extending above the seat, a rod movable in the yoke, and a valve fixed to the rod operable by the latter to engage or disengage said seat, said valve engaging the yoke to limit the movement of the rod in moving the valve to open position.

2. In a fountain pen, a barrel, a plunger movable therein and having a passage therethrough, a closure for one end of the barrel having an extension provided exteriorly with left hand screw threads, a rod for reciprocating the plunger movable through said closure and extension, a head on the outer end of the rod, a valve on the rod, said rod being relatively movable with respect to the plunger to permit movement of the valve to open or close said passage, a member threaded on the extension, a collar on the extension for maintaining the member against removal from the extension, and a cap having a right hand screw threaded engagement with the member and provided with a pocket to receive the rod head.

3. In a fountain pen, a barrel, a plunger movable therein and having a passage therethrough, a closure for one end of the barrel having an extension provided exteriorly with screw threads, a rod for reciprocating the plunger movable through said closure and extension, a head on the outer end of the rod, a valve on the rod, said rod being relatively movable with respect to the plunger to permit movement of the valve to

open or close said passage, a member threaded on the extension, a collar on the extension for maintaining the member against removal from the extension, and a cap threaded reversely from the extension for threaded engagement with the member and provided with a pocket to receive the rod head.

4. In a fountain pen, a barrel having a tubular plunger movable therein and provided with a valve seat, a yoke on the plunger, a rod movable in the yoke, and a valve fixed to the rod for operation by the latter to engage or disengage said seat, the valve engaging the yoke to limit movement of the rod in moving the valve to open position.

5. In a fountain pen, a barrel having a tubular plunger movable therein and provided with a valve seat, a yoke on the plunger, a rod movable in the yoke, and a valve fixed to the rod for operation by the latter to engage or disengage said seat, the valve engaging the yoke to limit movement of the rod in moving the valve to open position, said yoke comprising spaced arms projecting from the plunger, and a collar connecting the free end of the arms and with which the valve directly engages to limit movement of the rod in moving the valve to open position.

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