



# UNITED STATES PATENT OFFICE

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## FOUNTAIN PEN

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This invention relates to fountain pens and particularly to devices of this class of the stylus type and the object of the invention is to provide improved means for controlling the transmission of ink from the well of the pen to the point thereof; a further object being to provide improved means for ventilating the pen to control the feed of ink therefrom and also to facilitate the filling of the pen, said vent being in the form of a passage of such arrangement and form as to prevent a sudden discharge of the ink therethrough in certain uses of the pen; a further object being to provide a weighted plunger controlling and actuating the feed needle of the pen, and especially a weight of this class including a reserve ink chamber providing for an instantaneous feed of ink to the point and also to maintain a moist condition within the pointed end portion of the pen to prevent and obviate the hardening of the ink; a still further object being to provide an ink trap at the base of the air vent to control and regulate the discharge of ink from the pen; and with these and other objects in view, the invention consists in a fountain pen of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a longitudinal, sectional view through a pen made according to my invention, part of the construction being shown in elevation in full lines.

Fig. 2 is an enlarged, sectional, detail view of part of the construction shown in Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 2; and,

Fig. 5 is an elevation of a part of the structure shown in Fig. 1, and illustrating a modification.

In Fig. 1 of the drawings, 10 represents the barrel of the pen in which is contained the

usual compressible inner reservoir or sack 11, controlled through the usual filling bar indicated in dotted lines at 12 in Fig. 1 of the drawings. The open end 13 of the sack 11 is mounted upon a tip casing 14 or a reduced extension 15 at the inner end thereof. This casing is mounted in the open end of the barrel 10, and in the construction shown, said casing has a tight, sliding fit with the barrel, or other means of attachment may be employed.

The casing 14 is tubular in form, and the bore thereof is internally threaded as seen at 17 adjacent the outer end thereof and throughout substantially one half the length of said casing, to receive a plug and point supporting member 18, having two enlarged, internally threaded collars 19 and 20, spaced apart by a reduced portion 21.

The collar 19 is arranged at the inner end of the plug 18 and projecting from the collar 20 is a reduced extension 22, the end of which is beveled as seen at 23. The plug 18 is tubular in form to provide a comparatively large bore 24 therein which is reduced at the lower end of said plug as seen at 24a, note Fig. 2 of the drawings. In the reduced portion 24a of the bore is mounted a tubular pen point 25, preferably having a pressed or snug fit in the bore 24a. The inner end of the point 25 is tapered to meet a corresponding taper in the bore 24 as seen at 26 so as to guide the placement of a pin or needle valve 27 in the tubular point 25. The outer end of the point 25 is rounded as seen at 25a to facilitate the free movement of the point over a paper in the use of the pen, and the outer end of the pin 27 is correspondingly rounded as seen at 27a. The upper end of the bore 24 is enlarged as seen at 24b, this enlargement being arranged within the collar 19. Below the collar 19, the reduced portion 21 has an annular groove 28, and at a predetermined point, an aperture 29 opening into the bore 24 and outwardly into a chamber 30 formed in the casing 14 between the collars 19 and 20 and the reduced portion 21. This chamber forms an ink trap controlling the feed of ink through the pen, and also forms part of an air vent controlling the

discharge of ink from the pen, as will be apparent.

In the construction shown in Figs. 1 to 4 inclusive, the plug 18 or the collar 20 thereof is provided with a spiral groove 31, cut through the threads of said collar and extending from the lower surface thereof to the upper surface thereof, so as to place the chamber 30 in communication with a passage 32 arranged outwardly of the reduced extension 22 of the plug 18 and the lower end of the casing 14. The upper end of the groove 31 terminates at a point oppositely disposed with respect to the location of the aperture 29, so as to prevent any possible direct ink flow from the aperture 29 to and through the groove 31.

In Fig. 5 of the drawings, a slight modification in the construction of the plug 18 is shown, wherein the threaded collar 20, instead of having the spiral groove 31, is provided with an annular groove 31a arranged centrally thereof, with which two vertical grooves 31b and 31c communicate, the groove 31b opening through the lower surface of the collar 20 at one side of said collar, whereas the groove 31c opens through the upper surface of said collar at the opposite side thereof, so that an indirect passage equivalent to the spiral groove is provided in the collar 20. It will also be understood that the groove 31c is disposed in opposite relation with respect to the aperture 29.

The upper end of the casing 14 has a transverse wall 14a in which is formed an aperture 33, so as to place the chamber of the sack 11 in communication with the chamber 34 formed in the upper end of the casing 14, and above the collar 19, and it is also preferred that the top of the casing 14 be provided with a transverse groove or slot 35 passing through the aperture 33 so as to encourage a direct feed of the ink through the sack 11 into the chamber 34. Movably mounted in the chamber 34, is a plunger 36 comprising a weighted body 37 of suitable heavy metal; and if lead is employed, this body is contained in a tube 38 composed of rubber or similar material upon which the ink will have no chemical action. Coupled with the weight 37 centrally of the lower end thereof is a rod 39 composed of rubber or similar material, and this rod extends downwardly through the bore 24 and 24b of the plug 18 and to the lower end of which is attached the pin 27, the latter being preferably composed of gold or similar metal, upon which the ink will have no chemical action. At this time, attention is directed to the fact that the diameter of the pin 27 is slightly less than the diameter of the bore 25b in the pen point, so as to provide for the free passage of ink downwardly around the pin 27 for discharge through the lower end of the

point 25, and a comparatively large passage is formed in the bore 24 around the rod 39.

It will be noted that the weight 37 is shorter than the tube 38 so as to form a chamber 40 around the rod 39 within the lower end of said tube, and this chamber forms a storage reservoir for the ink when the pen is in inverted position to provide an instantaneous feed of the ink to the pen point in the initial use thereof, and also maintains a moist, atmospheric condition within the bores or passages 24, 24b, 25b, as well as the chamber 34, to prevent, to a large degree, the hardening of the ink in these passages.

The lower end of the tube 38 is cut out at spaced intervals to provide circumferentially spaced ink feed passages 41, wherein ink may pass through the chamber 34 into the bore 24b—24 as will be apparent. The lower end of the tube 38, intermediate the passages 41, rests upon the upper surface of the plug 18 or the collar 19 thereof to limit the outward movement of the pin 27 with respect to the point 25, it being understood that when the pen is held in normal position and in the operation of writing, the pin 27 normally projects through and beyond the point 25, so that in the operation of writing, the pin 27 is first raised by engagement with the paper against the action of the weight plunger 36 to allow for the flow of ink downwardly around the pin 27 and outwardly through the point 25.

By virtue of the rounded contour of the end of the point 25, the pen may be held in angular relation with respect to the surface over which the pen is passed, and provided for the free flow of ink to and through the pen point. In this operation, air is admitted into the bore 24 through the air vent 31, 31a, 31b, 31c and the aperture 29.

In using lead as the weight medium, I preferably coat the upper and lower surfaces of this body with suitable material as seen at 42 and 43, the material employed having no chemical action upon the ink used in the pen, thus preventing the lead from coming in contact with the ink, lead having chemical action on certain inks, which has been found to be detrimental. At this time, it will be understood, however, that the entire plunger may be made up of a material suitable for the purpose intended, in which event, the use of the coatings and facings is unnecessary.

From the foregoing, it will be apparent that in the use of the pen, the pin 27 is moved upwardly and downwardly with respect to the plug 18 and the pen point 25, and in this operation, the plunger moves off from its seat on the collar 19, providing a free ink flow into the bore 24.

After using the pen, and in moving the same into an inverted position, any ink contained in the bore 24 will drop into the cham-

ber 40, the excess passing into the chamber 34 and into the sack 11 so that when the pen is again brought into use, the movement of the pen into writing position will cause the ink in the chamber 40 to drop into the bore 24, which is encouraged by the ink flow from the sack 11 to provide for an instantaneous feed of ink to the pen point 25 or the passage 25*b* therein.

In filling or refilling the pen, the sack 11 is compressed by the filler bar 12 as in other self-filling fountain pens, well known in the art, and the lower end of the pen is submerged in a body of ink sufficiently to cover the lower portion of the casing 14. As the filler bar is released, the ink will be drawn directly into the sack 11 through the air vent passage 31 and aperture 29, and thus through the bore 24—24*b* and chamber 34. After filling, the movement of the pen into inverted position or with the point directed upwardly, will cause any ink contained in the ink trap 30 to be fed into the bore 24 through the aperture 29.

In the use of the pen, should a slight congestion prevail, and it is required to oscillate the pen to a slight degree to encourage ink flow, the reserve storage of ink in the chamber 40 will facilitate the instantaneous supply to the pen point and the vertical movement of the plunger 36 and the pin 27 carried thereby, will operate to free the passage 25*b*, permitting the discharge of ink there-through. In the above oscillation of the pen, to encourage the feed of ink if occasions arise requiring this operation, the arrangement of the groove 31 or the grooves 31*a*, 31*b* and 31*c* in the plug 18, will prevent any direct discharge of ink outwardly through the chamber 32, by virtue of the irregular, spiral or staggered arrangement of these grooves, thus obviating the difficulties experienced in other pens of this class employing air vents arranged longitudinally and in parallel relation with respect to the longitudinal plane of the pen.

It will be understood that while I have shown certain details of construction for carrying my invention into effect, that I am not necessarily limited to these details, and various changes therein and modifications thereof, may be made within the scope of the appended claims, without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with a fountain pen of the class described, of an ink feed comprising a tubular casing detachably coupled with one end of the barrel of a pen, means whereby an ink sack may be coupled with the inner end of said casing, a tubular plug mounted in the outer end of said casing and project-

ing therebeyond, a tubular pen point in and projecting from the lower end of said plug, said plug forming in the lower end of said casing an ink trap, a passage opening outwardly through said casing around said plug, said plug being fashioned to form an indirect communication between said trap and passage and an aperture placing the upper end of said trap in communication with the bore of said plug adjacent the upper end thereof, a plunger movably disposed in said casing above said plug, a pin carried by said plunger and movably disposed in the bore of said pen point and adapted to project there-through, and means forming a reserve ink storage in said plunger adjacent the inner end of said plug.

2. In a fountain pen of the class described employing a tubular pen point and a plunger actuated pin movably disposed in said point and adapted to project therethrough, an ink reserve chamber formed in said plunger inwardly of the pen point and in direct communication with said point to provide instantaneous flow of ink to the point when the pen is moved into writing position.

3. The combination with a fountain pen of the class described having a tubular pen point and a pin mounted in and movable longitudinally through the bore of said point, a plunger arranged in the body of the pen and in connection with which said pin is mounted and by means of which the same is movable with respect to said pen point, and means at the lower end of said plunger forming a reserve ink storage chamber in which ink will be collected in moving the pen from a writing position to an inverted position, and by means of which a direct feed of ink to the pen point is provided in again moving the pen into writing position.

4. A fountain pen of the class described, comprising a pen barrel, a tubular casing detachably mounted in connection with the open end of said barrel, means whereby a flexible ink sack may be supported in connection with the inner end of said casing, a plug detachably mounted in the lower end of said casing and projecting beyond said end, a tubular pen point mounted in connection with the projecting end of said plug and extending therebeyond and forming an ink feed chamber in the inner end portion of said casing, means for placing said chamber in communication with said sack, a weighted plunger in said chamber and carrying a rod extending through said plug, and a pin at the lower end of said rod and arranged in said pen point and adapted to project beyond the lower end thereof, the lower end of said plunger being tubular in form to provide a reserve ink storage chamber in direct communication with the bore of said plug around said rod, the tubular end of said

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plunger resting on said plug to limit the outward movement of said pin and being apertured to place the chamber of said casing in communication with the bore of said plug.

5 5. A fountain pen of the class described, comprising a pen barrel, a tubular casing detachably mounted in connection with the open end of said barrel, means whereby a flexible ink sack may be supported in connection with  
10 the inner end of said casing, a plug detachably mounted in the lower end of said casing and projecting beyond said end, a tubular pen point mounted in connection with the projecting end of said plug and extending therebeyond and forming an ink feed chamber in  
15 the inner end portion of said casing, means for placing said chamber in communication with said sack, a weighted plunger in said chamber and carrying a rod extending through said plug, and a pin at the lower end  
20 of said rod and arranged in said pen point and adapted to project beyond the lower end thereof, the lower end of said plunger being tubular in form to provide a reserve ink storage chamber in direct communication  
25 with the bore of said plug around said rod, the tubular end of said plunger resting on said plug to limit the outward movement of said pin and being apertured to place the chamber of said casing in communication  
30 with the bore of said plug, the periphery of said plug having spaced, enlarged collars fitting snugly in said casing and forming at the inner end of the plug and within said casing  
35 an ink trap, and an annular air passage opening to atmosphere at the lower end of said casing.

40 6. A fountain pen of the class described, comprising a pen barrel, a tubular casing detachably mounted in connection with the open end of said barrel, means whereby a flexible ink sack may be supported in connection with  
45 the inner end of said casing, a plug detachably mounted in the lower end of said casing and projecting beyond said end, a tubular pen point mounted in connection with the projecting end of said plug and extending therebeyond and forming an ink feed chamber  
50 in the inner end portion of said casing, means for placing said chamber in communication with said sack, a weighted plunger in said chamber and carrying a rod extending through said plug, and a pin at the lower end  
55 of said rod and arranged in said pen point and adapted to project beyond the lower end thereof, the lower end of said plunger being tubular in form to provide a reserve ink storage chamber in direct communication with the bore of said plug around said rod, the  
60 tubular end of said plunger resting on said plug to limit the outward movement of said pin and being apertured to place the chamber of said casing in communication with the bore of said plug, the periphery of said plug  
65 having spaced, enlarged collars, fitting snug-

ly in said casing and forming at the inner end of the plug and within said casing an ink trap, an annular air passage opening to atmosphere at the lower end of said casing, and one collar of said plug being grooved on its periphery in such manner as to place said ink trap and passage in communication with each other at circumferentially spaced intervals.

70 7. A fountain pen of the class described, comprising a pen barrel, a tubular casing detachably mounted in connection with the open end of said barrel, means whereby a flexible ink sack may be supported in connection with the inner end of said casing, a plug detachably mounted in the lower end of said casing and projecting beyond said end, a tubular pen point mounted in connection with the projecting end of said plug and extending therebeyond and forming an ink feed chamber in the inner end portion of said casing, means for placing said chamber in communication with said sack, a weighted plunger in said chamber and carrying a rod extending through said plug, and a pin at the lower end of said rod and arranged in said pen point and adapted to project beyond the lower end thereof, the lower end of said plunger being tubular in form to provide a reserve ink storage chamber in direct communication with the bore of said plug around said rod, the tubular end of said plunger resting on said plug to limit the outward movement of said pin and being apertured to place the chamber of said casing in communication with the bore of said plug, the periphery of said plug having spaced, enlarged collars, fitting snugly in said casing and forming at the inner end of the plug and within said casing an ink trap, an annular air passage opening to atmosphere at the lower end of said casing and one collar of said plug being grooved on its periphery in such manner as to place said ink trap and passage in communication with each other at circumferentially spaced intervals, and means at the inner end of the ink trap for placing said trap in communication with the bore of said plug.

8. In fountain pens of the class described, a tubular plug body, a tubular pen point mounted in and projecting from one end of said body, and two enlarged collar portions on said body inwardly of the pen point end thereof, and one of said collars having a single groove formed in the periphery thereof and opening through the upper and lower ends of said collar at circumferentially spaced intervals.

9. In fountain pens of the class described, employing a tubular pen point, a pin movably disposed in said point and adapted to project beyond the end thereof and having means for directing the flow of ink to said point and around said pin, a weight plunger in connection with which said pin is mount-

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ed and by means of which said pin is movable with respect to said pen point, said plunger having at the lower end thereof, an ink reserve storage chamber in which ink may be supported when the point of the pen is in upright position.

10. In fountain pens of the class described, employing a tubular pen point, a pin movably disposed in said point and adapted to project beyond the end thereof and having means for directing the flow of ink to said point and around said pin, a weight plunger in connection with which said pin is mounted and by means of which said pin is movable with respect to said pen point, said plunger having at the lower end thereof, an ink reserve storage chamber in which ink may be supported when the point of the pen is in upright position, and said pin being coupled with said plunger through a rod projecting from the central portion of said chamber.

11. A fountain pen of the class described comprising a tip casing, a tubular plug arranged in said casing, a tubular pen point supported in and projecting beyond the outer end of said plug, said plug having an air vent passage staggeredly disposed thereon to control the feed of ink into said plug and through said point, said passage opening to atmosphere within said casing and into the bore of said plug adjacent the upper end thereof.

12. A fountain pen of the class described comprising a tip casing, a tubular plug arranged in said casing, a tubular pen point supported in and projecting beyond the outer end of said plug, said plug having an air vent passage staggeredly disposed thereon to control the feed of ink into said plug and through said point, said passage opening to atmosphere within said casing and into the bore of said plug adjacent the upper end thereof, and a pin movably disposed in said point and normally projecting beyond the end thereof, and a weighted plunger movably disposed in said casing above said plug and in connection with which said pin is coupled.

13. The combination with a fountain pen of the class described, of an ink feed comprising a tubular casing detachably coupled with one end of the barrel of a pen, means whereby an ink sack may be coupled with the inner end of said casing, a tubular plug mounted in the outer end of said casing and projecting therebeyond, a tubular pen point in and projecting from the lower end of said plug, said plug having an annular groove in the periphery thereof forming between said casing and plug an ink trap, and an annular passage opening outwardly through said casing circumferentially spaced intervals to form an indirect communication between the trap air vent opening to said trap and passage at ing around said plug, said plug having an

and passage, and said plug having an aperture placing the upper end of said trap in communication with the bore of said plug.

14. The combination with a fountain pen of the class described, of an ink feed comprising a tubular casing detachably coupled with one end of the barrel of a pen, means whereby an ink sack may be coupled with the inner end of said casing, a tubular plug mounted in the outer end of said casing and projecting therebeyond, a tubular pen point in and projecting from the lower end of said plug, said plug having an annular groove in the periphery thereof forming between said casing and plug an ink trap, an annular passage opening outwardly through said casing around said plug, said plug having an air vent opening to said trap and passage at circumferentially spaced intervals to form an indirect communication between the trap and passage and said plug having an aperture placing the upper end of said trap in communication with the bore of said plug, a plunger movably disposed in said casing above said plug, and a pin carried by said plunger and movably disposed in the bore of said pen point and adapted to project there-through.

15. In a fountain pen of the class described, a tubular plug, a tubular pen point in the free end of said plug, a plunger actuated pin movably disposed in said point and adapted to project therethrough, the other end portion of the plug having spaced upper and lower annular collars, and the lower collar having a spiral peripheral groove forming an indirect air vent passage opening into said plug body between said collars and to atmosphere below the lower collar.

16. In a fountain pen of the class described, a tubular plug, a tubular pen point in the free end of said plug, a plunger actuated pin movably disposed in said point and adapted to project therethrough, the other end portion of the plug having spaced upper and lower annular collars, the lower collar having a spiral peripheral groove forming an indirect air vent passage opening into said plug body between said collars and to atmosphere below the lower collar, the plunger of said pin being adapted to normally seat upon the upper collar, and means for placing the exterior of the plunger in communication with the bore of the plug when said plunger is in seated position.

17. In a fountain pen of the class described, a tubular plug, a tubular pen point in the free end of said plug, a plunger actuated pin movably disposed in said point and adapted to project therethrough, the other end portion of the plug having spaced upper and lower annular collars, the lower collar having a spiral peripheral groove forming an indirect air vent passage opening into said plug body between said collars and to atmosphere

below the lower collar, the plunger of said pin being adapted to normally seat upon the upper collar and means for placing the exterior of the plunger in communication with the bore of the plug when said plunger is seated position, and an ink reserve chamber formed at the lower end of said plunger and in direct communication with the bore of said plug.

18. In a fountain pen of the class described employing a tubular pen point and a plunger actuated pin movably disposed in said point and adapted to project therethrough, a casing, a tubular plug body mounted in said casing and in the lower end of which said point is supported, the periphery of said plug having a spiral groove forming an indirect air vent passage opening to atmosphere and into the upper end of said plug.

19. In a fountain pen of the class described employing a tubular pen point and a plunger actuated pin movably disposed in said point and adapted to project therethrough, a casing, a tubular plug body mounted in said casing and in the lower end of which said point is supported, the periphery of said plug having a spiral groove forming an indirect air vent passage opening to atmosphere and into the upper end of said plug, the plunger of said pin including a weighted body disposed in the casing above said plug and normally seating thereon to form a chamber in the casing above said plunger, and the upper end of the casing being apertured to provide for the admission of ink into the casing around said plunger through the bore of said plug and outwardly through the pen point around the pin disposed therein.

20. In fountain pens of the class described, a tubular plug body, a pen point mounted in and projecting from one end of said body and to enlarged collar portions on said body inwardly of the pen point end thereof, one of said collars having a single air vent passage formed in the periphery thereof and opening through the upper and lower ends of the collar at circumferentially spaced intervals, and that portion of the plug between said collars forming an annular chamber having an aperture placing the bore of said plug in communication with said chamber.

In testimony that I claim the foregoing as my invention I have signed my name this 25th day of July, 1930.

JOSEPH WALLACE.

**CERTIFICATE OF CORRECTION.**

Patent No. 1,824,249.

Granted September 22, 1931, to

**JOSEPH WALLACE.**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, line 62, claim 13, beginning with the word "circumferentially" strike out all to and including the word "an" in line 65, and insert instead passage opening outwardly through said casing around said plug, said plug having an air vent opening to said trap and passage at circumferentially spaced intervals to form indirect communication between the trap; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of April, A. D. 1932.

(Seal)

**M. J. Moore,**  
Acting Commissioner of Patents.