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FOUNTAIN PEN

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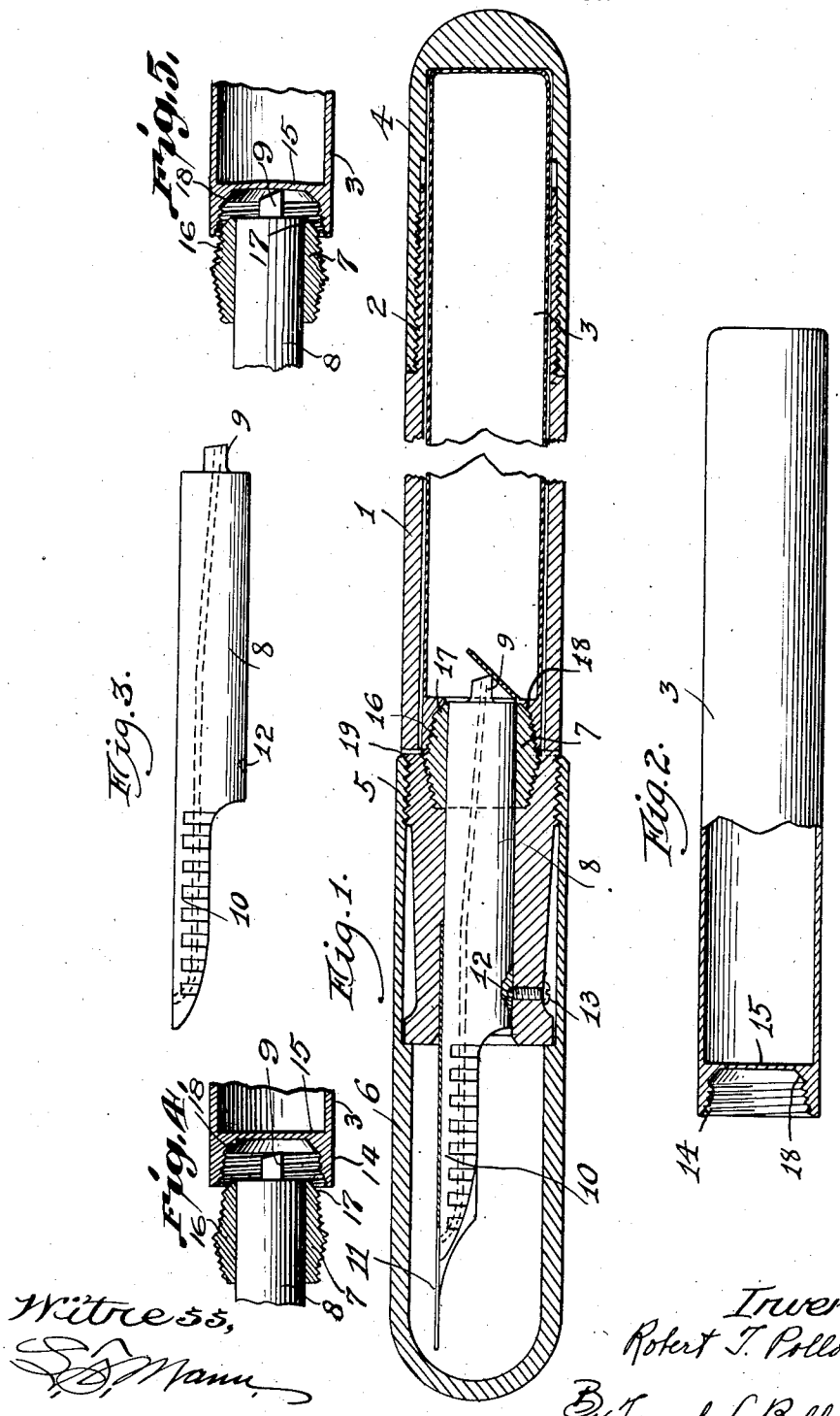

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FOUNTAIN PEN.

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This invention relates to fountain pens, and refers more particularly to a fountain pen in which the ink or writing fluid is contained in a cartridge positioned in the barrel of the pen.

Among the salient objects of the invention are to provide a fountain pen having a thin, sealed cartridge of pyralin celluloid, or metallic substance positioned in the barrel of the pen and fixed to the feed of the pen so that the ink is prevented from leaking into the pen barrel or from fouling the feed due to a seal arrangement between the cartridge and ink feed; to provide an improved type of cartridge for use in pens of this character and an adjustment for the pen feed and puncturing point which punctures the cartridge after placement in the barrel so that the feed is always properly positioned relative the cartridge and pen barrel, assuring free flow of ink and proper breaking and puncturing of the cartridge seal.

In the drawings:

Fig. 1 is a sectional side view of the pen.

Fig. 2 is a detail of the cartridge.

Fig. 3 is a detail view of the feed and Figures 4 and 5 are sectional views showing the connection between the cartridge and the bushing as the cartridge is approaching sealing position.

Referring in detail to the drawings, the ink barrel 1 is threaded at 2 to receive the sealing cap 4 and at 5 to receive the pen protecting cap 6. Within the barrel of the pen is a bushing 7 screwed near the pen holding portion of the barrel or in the lower part of the ink well. This bushing is bored and carefully reamed to receive the ink feed 8 which has a puncturing point 9 projecting into the ink compartment of the barrel and having a saddle at 10 to receive the pen point 11. The feed 8 is recessed at 12 to receive a screw 13 which is screwed into a threaded hole in the barrel and sets in to the recess 12 of the feed to position accurately the feed thereby assuring the same ink flow whenever set in this position and also positioning accurately the feed and puncturing point relative to the cartridge. The cartridge denoted as 3 is insertable into the pen barrel through the end of the barrel closed by the cap 4. This cartridge or container contains a writing fluid and is preferably of a metallic substance being sealed to retain the liquid ink in an air tight condition. The lower end of the cartridge has a hollow end as shown at 14 into which the puncturing point protrudes and punctures the container or cartridge at the inner cap 15. This cap is stamped in such a manner that it may be easily punctured by the point 9. The inner surface of the hollow end 14 is threaded to screw upon the threads 16 on the bushing 7. The end of the bushing which extends into the ink compartment has a "45 degree" bevelled seat 17 upon which the cartridge seats, the "45 degree" bevel 18 on the cartridge fitting snugly against the bevel 17 on the bushing, the threads 14 screwing upon the threads 16 of the bushing.

On inserting the ink cartridge or container into the pen barrel, the cartridge is set against the bushing and screwed thereon, the puncturing point 9 pushing out the sealing cap 15 and permitting the ink to flow into the feed. The engagement of the bushing with the ink cartridge is effected by triple threads so that the cartridge is turned into complete engagement so that the bevels of the respective units seat with from a quarter to a full turn of the cartridge. This not only insures a liquid tight connection between the ink feed and container but prevents any fouling of the ink barrel caused by the ink seeping back into the barrel of the pen and forward into the pen holding portion. Around the surface of the barrel are drilled small holes 19 communicating both with the ink compartment and the air. The purpose of these vent holes is to prevent a vacuum being formed with the barrel in withdrawing the cartridge. The holes permit air to pass into the barrel as the cartridge is withdrawn, thereby preventing any unused ink or writing fluid to be drawn out into the ink compartment during the withdrawal operation. If this precaution is not taken, as the cartridge is removed from the barrel any unused or waste ink left in the empty cartridge will be withdrawn from the cartridge and distributed along the ink compartment of the pen, fouling the barrel. The screw 13, as explained, near the feed, is properly positioned in the pen holding portion of the barrel and bushing 7 fits into the recess 12 of the feed portion. The accurate positioning of the feed relative to the ink cartridge and pen point assures a constant and identical ink flow at all times and positions accurately the puncturing point

relative to the cartridge so that puncturing the seal will be effected properly.

In screwing the cartridge onto the bushing 7 the hollow end of the cartridge is first sealed by engagement of the threads 16 and 17 making a liquid tight seal.

I claim as my invention:

1. A fountain pen having an interchangeable sealed ink cartridge insertable in the barrel of the pen, an ink feed in said barrel having a puncturing point for breaking the seal of the ink cartridge when the latter is in position in the pen and means for accurate positioning of the ink feed within said barrel comprising a pin passing through the wall of the barrel and engaging the ink feed.

2. A fountain pen having a sealed ink cartridge insertable into the barrel of the pen, a feed unit adapted to break the seal of the cartridge and feed the ink to the pen, and means for accurately positioning the feed unit in the pen barrel relative to the ink cartridge comprising an element passing through the wall of said pen barrel and cooperatively engaging the feed unit.

3. A fountain pen having a barrel, provided with an opening, an ink feed insertable in said opening and adapted to support and carry a writing point, an interchangeable cartridge insertable in the barrel, a puncturing point on said ink feed, and means engaging the lower part of the barrel with the ink feed for preventing a displacement thereof relative to the barrel, said means comprising a pin passing through an aperture in the wall of the said barrel, and having cooperative engagement with said ink feed.

4. In a fountain pen, the combination with an ink barrel having a central opening passing through the lower portion thereof with a tapering socket near the upper end of said opening, an ink feed insertable in said opening, a bushing threaded to the walls of the tapering socket surrounding said ink feed, an interchangeable ink cartridge disposed within the upper portion of the barrel of the pen, said cartridge being formed with internal threads disposed around a flange thereof to cooperate with and engage complemental threads on said bushing, and the puncturing point carried by said feed for rupturing said cartridge.

5. In a fountain pen the combination with a barrel having a lower portion formed with an opening adapted to receive an ink feed inserted in said opening, a bushing engaging said feed and cooperating with said barrel for a portion of its length, an insertable cartridge disposed within the barrel over said bushing, said cartridge being provided with threads adapted to cooperate with complemental threads on a portion of the bushing whereby the cartridge is sealed to the barrel, and a puncturing point adapted to rupture a weakened portion of the cartridge when the cartridge is sealed.

6. In a fountain pen, the combination with a barrel having an opening passing through the lower portion thereof, an ink feed inserted within said opening, a bushing connected with the barrel and engaging said ink feed, threads arranged on said bushing, a cartridge adapted to be inserted within the barrel of the pen, said cartridge having an internal threaded portion to cooperate with the threads on the bushing for effecting a screw connection between said bushing and cartridge, and a puncturing point for rupturing said cartridge when said cartridge is sealed.

7. In a fountain pen, the combination with a barrel having an upper portion adapted to receive an insertable cartridge, the lower portion of said barrel having an opening therein, an ink feed disposed within said opening, a bushing having threaded portions tapering from the center thereof, surrounding said ink feed with the threads of said bushing on one side of the center cooperating with threads on said barrel, an ink cartridge disposed within the barrel and having a tapered threaded flange portion adapted to cooperate with the threaded surface disposed on the other side of said bushing whereby said cartridge is sealed to the barrel, and a puncturing point carried by the pen feed for rupturing said cartridge.

8. In a fountain pen, the combination with an ink barrel having a central opening passing through the lower portion thereof, said opening being enlarged at its upper end and having its walls provided with threads, an ink feed inserted in said opening, a bushing encircling said ink feed at its upper end and being provided with threads cooperating with the threads on the walls of the enlarged portion of said central opening in said barrel, an interchangeable metallic ink cartridge disposed within the upper portion of the barrel of the pen, said cartridge having internal threads at its lower end adapted to engage complemental threads on a portion of said bushing, and a puncturing point for rupturing said cartridge when the cartridge is screwed to the bushing.

9. In a fountain pen, the combination with a barrel having a cartridge receiving opening and formed at its lower end with a central ink feed receiving opening, an ink feed disposed within said opening, a bushing encircling the upper part of said feed and having external threads, a portion of said bushing being threaded to the interior walls of the ink feed receiving opening, an insertable cartridge disposed in said cartridge receiving opening of the barrel, said cartridge being provided at its lower end with permanent threads adapted to cooper-

ate with complemental threads on a portion of the bushing whereby the cartridge is sealed to the barrel, and a puncturing point adapted to rupture a weakened portion of the cartridge when the same is threaded to said bushing.

10. In a fountain pen, the combination with a barrel having a cartridge receiving opening and an ink feed receiving opening, said ink feed receiving opening passing through the lower portion of the barrel and having a part thereof of a diameter substantially less than the diameter of said cartridge receiving opening, an ink feed disposed within said ink feed receiving opening, a threaded bushing encircling said ink feed and threaded to the walls of an enlarged portion of said ink feed opening, a cartridge disposed within the barrel in the cartridge receiving opening of said barrel, said cartridge having an internal threaded portion adapted to cooperate with the threads on the bushing for effecting a screw connection between the bushing and cartridge, and a puncturing point for rupturing the cartridge.

11. In a fountain pen, the combination with a barrel having a central opening in the lower portion thereof, said opening being enlarged near its upper end with the walls thereof threaded, an ink feed disposed within said opening, an externally threaded bushing fitting around said ink feed, the threads of a portion of said bushing engaging the threads on the walls of the enlarged part of the central opening, an interchangeable metallic ink cartridge disposed within the upper portion of the barrel of the pen, said cartridge being formed with permanent threads at its lower end adapted to engage complemental threads on a portion of said bushing, and a puncturing point for rupturing said cartridge when the same is screwed in position.

12. In a fountain pen, the combination with an ink barrel having an interior opening at its lower end, an ink feed disposed within said opening, a bushing fitting around the upper part of said ink feed, and threads for uniting said bushing to the walls of the central opening in said barrel, an interchangeable ink cartridge disposed within the upper part of the barrel, said cartridge being formed with permanent internal threads adapted to engage threads on a portion of said bushing projecting beyond the central opening in the barrel, and a puncturing point carried for rupturing a weakened portion of said cartridge.

13. In a fountain pen, the combination with a barrel having a cartridge receiving opening and an ink feed receiving opening of a diameter less than said cartridge receiving opening, of an ink feed disposed within said ink feeding opening, an extending part projecting from said barrel adjacent the ink feed receiving opening therein and into said cartridge receiving opening formed with a detachable connecting portion thereon and spaced from the walls of the cartridge receiving opening of the barrel, a cartridge disposed within said carriage receiving opening and having a part adapted to cooperate with said detachable connecting portion on said extending part for effecting a sealed connection between the cartridge and said extending part and a puncturing point adapted to rupture said cartridge.

14. In a fountain pen, the combination with a barrel having a cartridge receiving opening therein, and an ink feeding opening of a diameter less than the diameter of the said cartridge receiving opening, an ink feed disposed within said ink feeding opening, an extending part projecting from said barrel adjacent to said ink feed receiving opening therein and into said cartridge receiving opening and having threads disposed thereon spaced from the inner walls of the cartridge receiving opening of said barrel, a cartridge within said cartridge receiving opening and formed with a portion having portions adapted to cooperate with the threads on said extending part for effecting a sealed connection between said cartridge and said extending part and a puncturing point adapted to rupture said cartridge.

15. In a fountain pen, the combination with a barrel having a lower portion formed with an opening, an ink feed inserted in said opening, a tubular element engaging said feed and cooperating with said barrel for a portion of its length, a replaceable cartridge disposed within the barrel over said tubular element, said cartridge being provided with threads adapted to cooperate with complemental threads on a portion of the tubular element whereby the cartridge is sealed in the barrel, and a puncturing point adapted to rupture a weakened portion of the cartridge when same is inserted, the end of said tubular element immediately adjacent the complemental threads taking the form of a beveled seat on which the complemental beveled surface of the cartridge seal is adapted to seat to provide a liquid tight seal.

16. In a fountain pen, the combination with a barrel having a lower portion formed with an opening, an ink feed insertable in said opening having a cartridge puncturing point, a tubular element engaging said feed, a replaceable cartridge disposed within the barrel and provided with threads adapted to cooperate with complemental threads on a portion of the tubular element whereby the cartridge is sealed in the barrel, the end of said tubular element immediately adjacent said complemental threads taking the form of a beveled seat on which a complemental

beveled surface of the cartridge seal is adapted to seat to provide a liquid tight seal.

17. An ink cartridge comprising a substantially rigid metallic container filled with a writing fluid and having sealed ends, one of the ends being closed by a sealing cap having a puncturable area adapted to be pierced and through which the ink flows, a depressed internally threaded pen feed engaging portion, and a connecting portion between the puncturable area and the pen feed engaging portion having a bevelled surface.

18. An ink cartridge comprising a tubular metal container containing a writing fluid and having sealed ends, one of the ends being closed by a sealing cap having a puncturable area adapted to be pierced to permit flow of the writing fluid therethrough, a depressed internally threaded pen feed engaging portion, and a connecting portion therebetween having a surface tapering inwardly from the pen feed engaging portion to the puncturable area adapted to form a bevelled seat.

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