

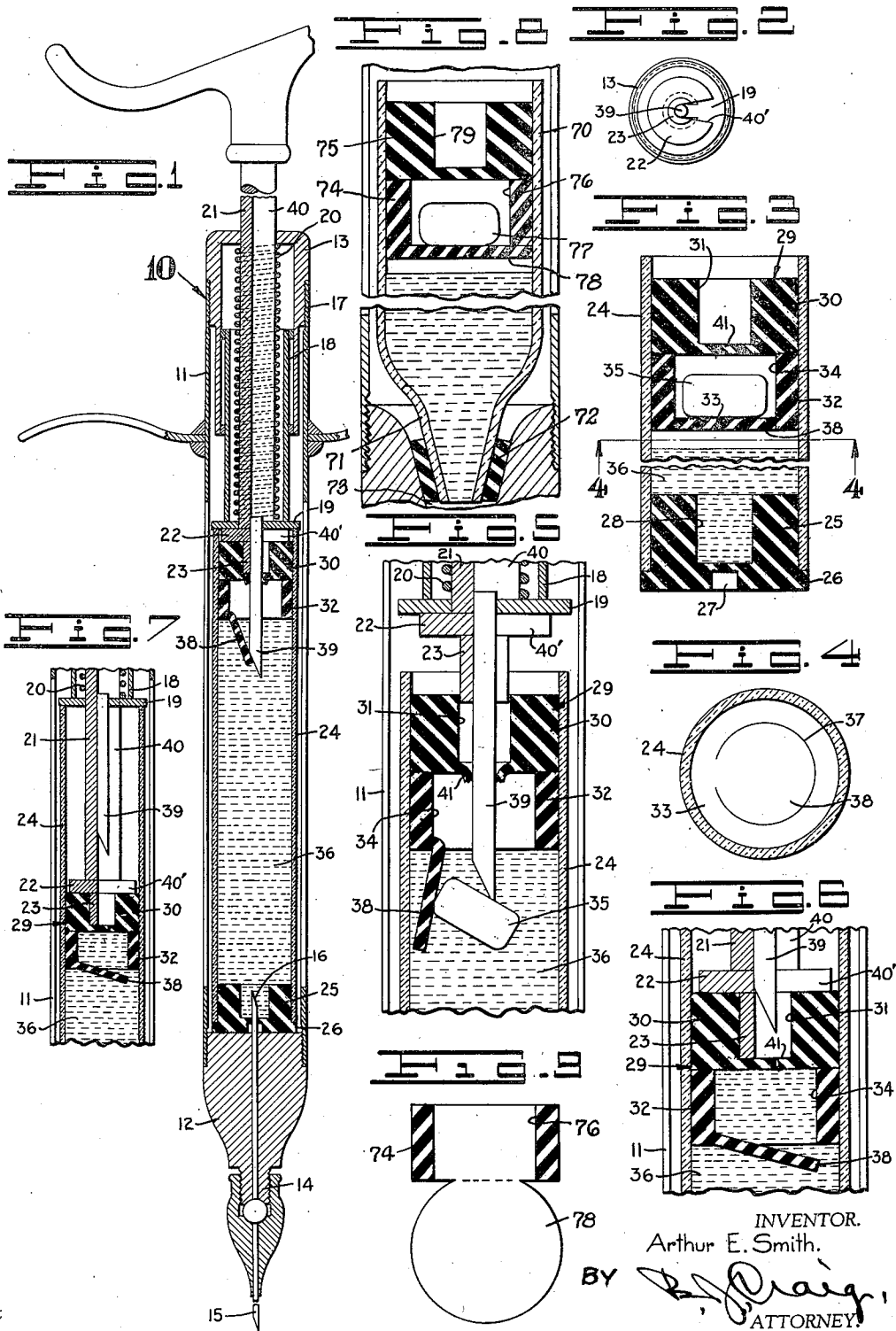
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SYRINGE

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SYRINGE

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This invention relates to hypodermic syringes. The general object of the invention is to provide an improved ampule type hypodermic syringe which is adapted for producing local anaesthesia.

Another object of the invention is to provide an improved ampule for use in preparing fresh solutions for injection.

Another object of the invention is to provide a novel plunger for use in a hypodermic syringe.

A further object of the invention is to provide a novel cork construction for use in a hypodermic ampule.

Other objects and the advantages of my invention will be apparent from the following description taken in connection with the accompanying drawing, wherein:

Fig. 1 is a central sectional view showing my invention;

Fig. 2 is an end view of the plunger member;

Fig. 3 is a fragmentary central sectional view through an ampule embodying the features of my invention;

Fig. 4 is a section taken on line 4—4, Fig. 3;

Fig. 5 is a fragmentary view showing the parts with the plunger being placed in position;

Fig. 6 is a view similar to Fig. 5 showing the piston plug as having been moved from the end of the ampule;

Fig. 7 is a view similar to Fig. 5 showing the parts in further advanced position;

Fig. 8 is a fragmentary sectional view showing a further modification of the invention; and

Fig. 9 is a section showing the position assumed by the trap door when the latter is displaced from sealing position.

Referring to the drawing by reference characters I have shown my invention as embodied in a syringe which is indicated at 10. As shown the syringe includes a barrel 11 having a front member 12 and a rear member 13. The front member includes a needle receiving portion 14 and has a needle 15 mounted therein the pointed inner end 16 of which extends into the barrel.

The cap 13 is threaded to the barrel as at 17 and includes a telescoping portion 18 which has a flanged head 19 thereon. A spring 20 engages the head and the inner portion of the cap thus tending to separate the head from the cap. A plunger rod 21 is slidable through the cap and is provided at its lower end with a flange 22 and with a tubular portion 23 which extends downwardly below the flange.

An ampule embodying the features of my invention is indicated generally at 24 and as shown comprises a cylindrical glass tube which at its lower end is provided with a cork 25 having a flange 26 thereon engaging the lower end of the ampule. The cork 25 has a small recess 27 in the end wall and an internal enlarged recess 28 opening into the ampule.

At the rear end the ampule is provided with a piston cork indicated generally at 29 which includes an upper resilient element 30 having a recess 31 therein which opens outwardly and a second element 32 having a lower end wall 33 and having a recess 34 which is closed by the element 30. The corks 25, 30 and 32 may be made of rubber or other similar resilient material.

The recess 34 provides a chamber for a medicinal tablet 35 which when in place in the chamber is hermetically sealed from the fluid and vehicular contents 36 of the ampule. The lower portion of the cork 32 is severed on a line 37 (see Fig. 4) to provide a trap door 38 the periphery of which is held normally in fluid tight position by the resiliency of the material of the cork, but which can be displaced as will be later described.

In use the ampule is placed in the barrel in the position shown in Fig. 1 after which the end member 13 is secured in place with the head 19 engaging the end of the ampule and with the flange 22 seated upon the cork 29. The corks 30 and 32 serve as a piston and are adapted to be moved by the flange 22 when the plunger is pressed as will be readily understood.

Mounted upon the head 19 I show a needle 39 which has a sharpened point. The plunger 21 has a groove 40 to slidably receive the needle 39. The flange 22 is notched as at 40' to receive the needle.

As the rear member 13 is moved to position, as shown in Fig. 5, the needle first pierces the lower wall 41 of the cork 30 then passes through, or pushes to one side, the tablet 35 and then impinges upon and opens the trap door 38 allowing the tablet material to pass into the liquid contents of the ampule. While this is occurring the sleeve 23 has entered the recess 31 and as the plunger is moved inwardly to the position shown in Fig. 6, the cork assembly 29 moves inwardly thus forcing the contents of the ampule through the needle 15.

When the plunger advances the corks 32 and 30 along the interior of the ampule, the wall 41 is forced off the needle 39 and, due to the resiliency of the material of the wall, the hole made by the needle is closed, as is shown in Figs. 6 and 7.

In Figs. 8 and 9 I show a modification of my invention wherein an ampule 70 includes a tapered front end 71. The ampule front end 71 may be originally made with a frangible integral tip adapted to be broken to provide an open end. The ampule 70 has an elastic washer 72 thereon adapted to engage a tapered portion 73 on the syringe to effect a tight seal. At the rear end the ampule 70 is provided with an inner cork 74 and an outer cork 75. The cork 74 includes a cavity 76 in which a tablet 77 is disposed and is held sealed by a trap door 78 which is in the nature of a flap integral with the cork and which engages the adjacent end portion of the cork 74.

The cork 75 is provided with an end recess 79 and is adapted to be used with a rear member 13 such as shown and described heretofore.

From the foregoing it will be apparent that I have invented a novel hypodermic syringe and ampule therefor which can be economically manufactured and which is highly efficient for the intended purpose.

Having thus described my invention, I claim:

1. In a hypodermic syringe, a barrel having a front member and a rear member thereon, said rear member having a head thereon, a plunger slidable through said rear member and through said head, said plunger having a flange thereon, a needle member mounted on said head and independent of said plunger, said plunger and said flange being grooved to slidably receive the needle member.

2. In a hypodermic syringe, a barrel having a front member and a rear member thereon, said front member including a needle projecting into said barrel, said rear member having a resiliently mounted head thereon, a plunger slidable through said rear member and through said head, said plunger having a flange thereon, a tube projecting inwardly from the flange, a needle member mounted on said head and independent of said plunger, said plunger, said flange and said tube being grooved to slidably receive the last mentioned needle member.

3. In a hypodermic syringe, a barrel having a front member and a rear member thereon, said rear member having a head thereon, a plunger slidable through the rear member and through said head, said plunger having a flange thereon, a tube projecting inwardly from the flange, a needle member mounted on said head and independent of said plunger, said plunger, said flange, and said tube being grooved to slidably receive said needle member, an ampule in said barrel, said ampule at the rear end having a piston cork therein, said piston cork comprising a pair of elements, one of said elements having an outwardly opening recess therein with a diaphragm closing said recess and adapted to be pierced by said needle member, the other piston element engaging said first piston element and having a recess closed by the first piston element, the lower wall of the second piston element being partially severed to provide a trap door, the periphery of which is normally held in fluid tight engagement by the resiliency of the material of the element and being adapted to be displaced by said needle member, and a medicinal preparation in said second element recess.

4. In a hypodermic syringe, a barrel having a rear member thereon, said rear member having a head thereon, a plunger slidable through the rear member and through said head, said plunger having a flange thereon, a needle member mounted on said head and independent of said plunger, said plunger and said flange being grooved to slidably receive the needle member, an ampule in said barrel, said ampule at the rear end having a piston cork therein, said piston cork comprising a pair of elements, one of said elements having an outwardly opening recess therein with a diaphragm closing said recess and adapted to be pierced by said needle member, the other piston element engaging said first piston element and having a recess closed by the first piston element, the lower wall of the second piston element being shiftably mounted and adapted to be displaced by said needle member.

5. In a hypodermic syringe, a barrel having a front member and a rear member thereon, said front member including a needle projecting into said barrel, said rear member having a resiliently mounted head thereon, a plunger slidable through the rear member and said head, said plunger having a flange thereon, a tube projecting inwardly from the flange, a needle mounted on said head and independent of said plunger, said plunger, said flange, and said tube being grooved to slidably receive the last mentioned needle, an ampule in said barrel, said ampule including a front cork having a diaphragm adapted to be punctured by said front member needle, said ampule at the rear end having a piston cork therein, said piston cork comprising a pair of elements, one of said elements having an outwardly opening recess therein with a diaphragm closing said recess and adapted to be pierced by said head needle, the other piston element engaging said first piston element and having a recess closed by the first piston element, the lower wall of the second piston element being partially severed to provide a trap door the periphery of which is normally held in fluid tight engagement by the resiliency of the material of the element and being adapted to be displaced by said head needle, and a medicinal preparation in said second element recess.

6. In a hypodermic syringe, a barrel having a front member and a rear member thereon, a plunger slidable through said rear member mounted in the rear member and, a needle member projecting into the barrel, an ampule in said barrel, said ampule at the rear end having a piston cork therein, said piston cork comprising a pair of elements, one of said elements having an outwardly opening recess therein with a diaphragm closing said recess and adapted to be pierced by said needle member, the other piston element engaging said first piston element and having a recess closed by the first piston element, the lower wall of the other piston element being partially severed to provide a trap door, the periphery of which is normally held in fluid tight engagement by the resiliency of the material of the element and being adapted to be displaced, and a medicinal preparation in said other piston element recess.

7. In a hypodermic syringe, a barrel having a front portion and a rear portion thereon, a plunger slidable through said rear portion, a needle member mounted on the rear portion and projecting into the barrel, an ampule in said barrel, said ampule at the rear end having a piston cork therein, said piston cork comprising an inner and an outer element, both of said elements being resilient and both slidable in the ampule, the outer element having a recess with a thin imperforate wall forming a closure for the recess, said thin imperforate wall being adapted to be pierced by said needle member, the inner piston element being disposed adjacent to the outer piston element, said inner element having a recess therein, a closure on the inner element for the inner element recess, said closure being partially severed from the inner element to provide a trap door, the periphery of the trap door being normally held in fluid tight engagement by the resiliency of the material of the inner element and being adapted to be displaced, and a medicinal preparation between said inner and outer elements.

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