July 31, 1945. A. E. SMITH 2,380,556

SYRINGE DEVICE

Filed May 27, 1944

Fig. 1

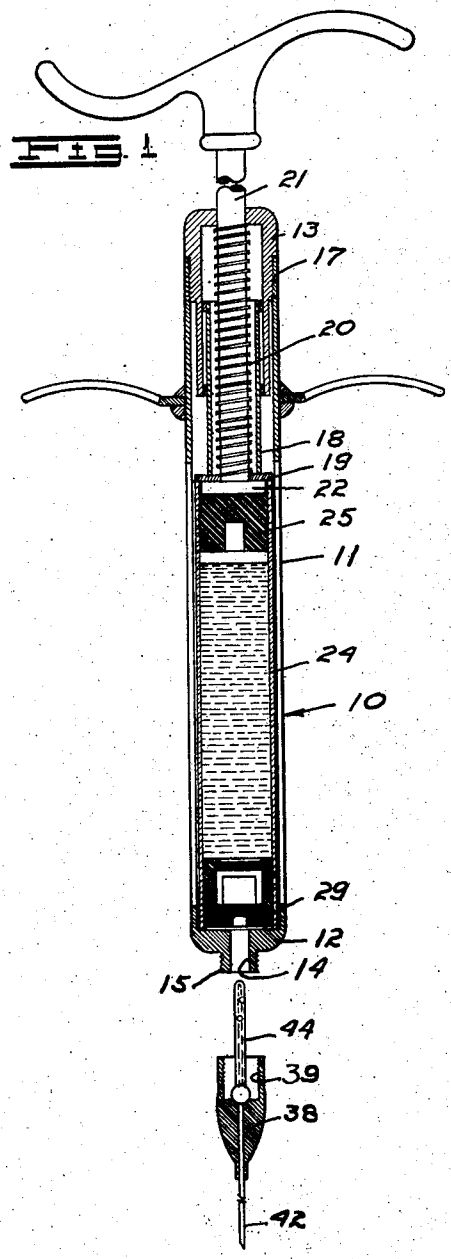


Fig. 2

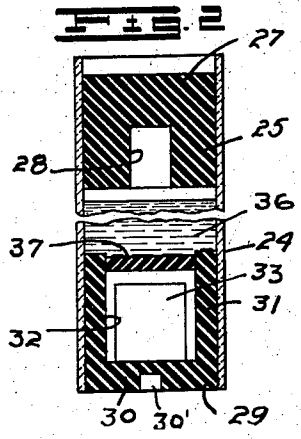
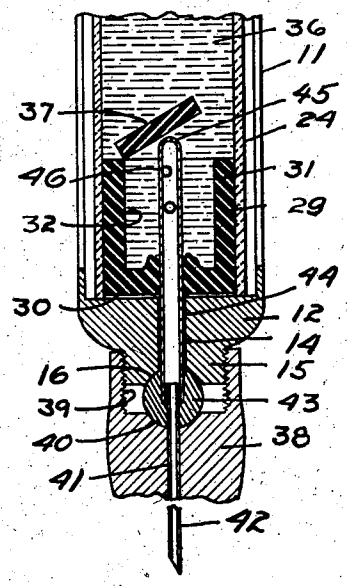


Fig. 3



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Patented July 31, 1945 2,380,556

UNITED STATES PATENT OFFICE

2,380,556

SYRINGE DEVICE

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Application May 27, 1944, Serial No. 537,598

1 Claim. (Cl. 128—218.1)

This invention relates to a syringe device.

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 means for causing mixture of a drug and vehicle in preparing fresh solutions for injection.

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

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 a fragmentary central sectional view through an ampule adapted to be used with my invention, and

Fig. 3 is an enlarged fragmentary sectional view showing the forward end of the syringe and ampule.

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 tube or needle receiving bore 14 and has a forwardly extending threaded portion 15 with the extreme end having a rounded recess 16.

The rear member 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.

An ampule is indicated generally at 24 and as shown comprises a cylindrical glass tube which at its rear end is provided with a piston cork 25 which has an end 27 engaged by the plunger flange 22 and an internal enlarged recess 28 opening into the ampule.

At the front end the ampule is provided with a cork, indicated generally at 29, which includes an end wall 30 having an integral skirt 31 providing a recess 32 which opens inwardly.

The recess 32 provides a chamber for a medicinal tablet 33 which, when in place in the chamber, is hermetically sealed from the fluid and vehicular contents 36 of the ampule by a disc 37 which engages the inner wall of the skirt 31. The disc 37 is held normally in fluid tight position by the resiliency of the material of the cork but can be displaced, as will be later described. The corks 25 and 29 and the disc 37 may be made of rubber or other suitable resilient material.

The threaded portion 15 is adapted to be engaged by a tip member 38 which has an internally threaded recess 39 and which has an arcuate recess 40. The tip 38 has a central aperture 41 which is adapted to receive a hypodermic needle 42 which at its upper end is provided with a ball 43 which fits in the recesses 16 and 40. The ball 43 may be made of soft material such as lead. The upper end of the needle 42 is received in the lower end of a tube 44. The tube 44 and needle 42 are held in position by the ball 43 as shown. The inner end of the tube is closed as at 45 and the side wall of the tube is provided with a plurality of apertures 46 which afford communication from the exterior of the tube to the interior of the tube, whence fluid passes into the needle 42 for injection. The end wall 30 of the cork has a central recess 30'.

In use the ampule is placed in the barrel as shown in Fig. 1, whereupon the removable needle 42 is placed in the tip 38 and is moved to the position shown in Fig. 1. The tube 44 is then moved into the bore 14 and enters the recess 30'. The end 45 of the tube ruptures the end wall portion 30 with the recess 30' and the tip enters the cork 29. As the tip 38 is screwed into place the end 45 of the tube impinges upon the disc 37 and forces the disc out of the recess 32 as shown in Fig. 3 so that the medicinal tablet may be dissolved by the vehicle. The syringe is then ready for use.

Having thus described my invention, I claim:

A hypodermic syringe including a barrel having a rear member, a plunger slidable in the rear member, said barrel having a front closure member at its front end, said barrel adapted to receive without opening, and retain an ampule seated in said barrel, said ampule having a piston cork in its rear end engageable by said plunger and a second cork in its front end, said ampule containing a fluid between said corks, said second cork having an inwardly opening recess and having a piercable diaphragm portion forming the outer wall of said recess, a forceable disc in said second cork and spaced from said diaphragm, a medicinal pellet in said second cork recess, said front closure member having a threaded portion, a removable tip having a threaded portion adapted to engage the threaded portion of said front

closure member, said tip having a bore therethrough, a needle arranged in said bore, an enlarged tubular member mounted on the inner end of said needle and communicating therewith and a sealing ball mounted upon said needle and said tubular member at their junction and sealing the same, said tip having a curved portion adjacent its upper end, the lower portion of said ball resting within said curved portion, said front member having a curved recess, and a bore adapted to receive said tubular member until the upper portion of said ball is positioned within said curved recess, said tubular member having a closed upper end and at least one opening in its side walls, said tubular member being of a length and strength to pierce and extend through said diaphragm and to engage and force said disc away from said second cork to thereby open the ampule seated in the barrel.

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