

March 28, 1944.

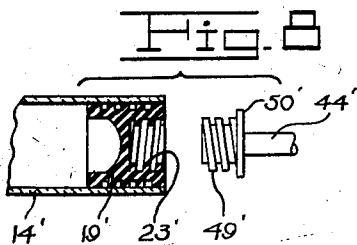
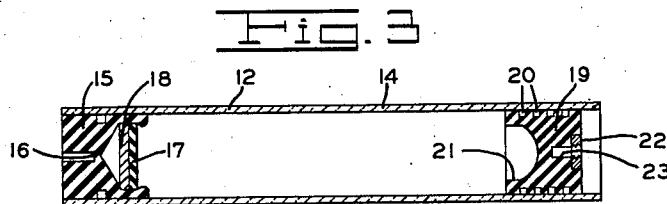
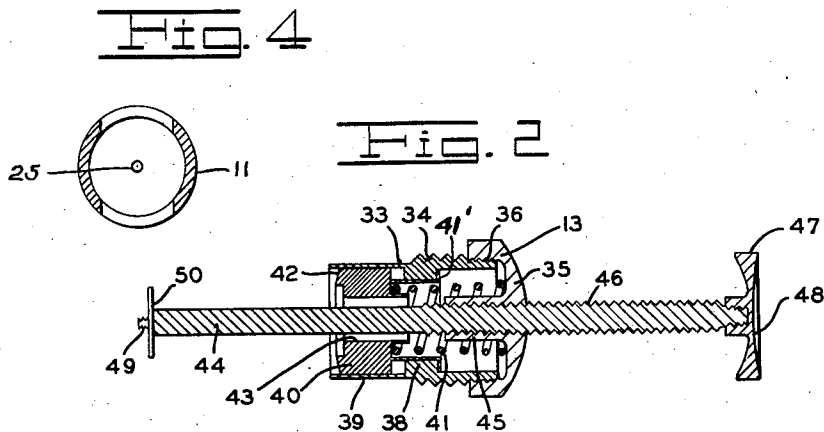
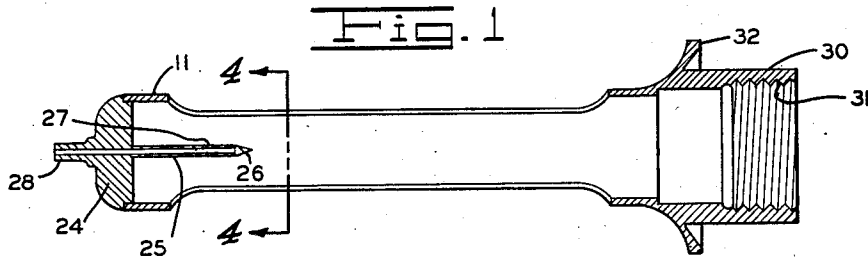
A. E. SMITH

2,345,302

ANAESTHETIZING SYRINGE

Filed May 8, 1942

2 Sheets-Sheet 1



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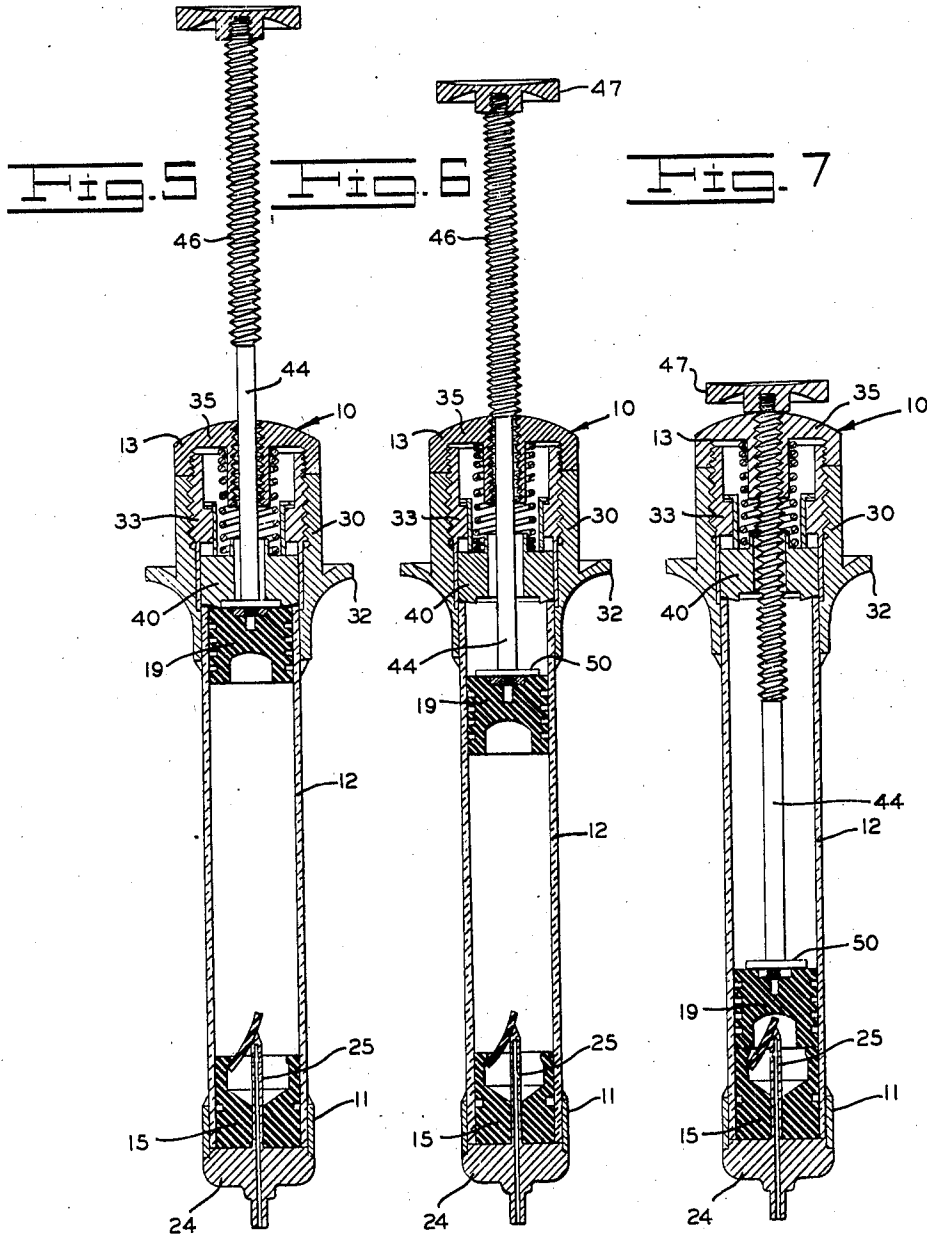
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UNITED STATES PATENT OFFICE

2,345,302

ANESTHETIZING SYRINGE

Arthur E. Smith, Los Angeles, Calif.

Application May 8, 1942, Serial No. 442,163

1 Claim. (Cl. 128—218)

This invention relates to anesthetizing syringes. The general object of the invention is to provide a novel syringe which is particularly adapted for use in producing general anesthesia.

A more specific object of the invention is to provide a syringe including a novel barrel member.

An additional object of the invention is to provide a syringe including a barrel having a novel rear member thereon.

A further object of the invention is to provide a syringe including an ampule having a piston cork therein and wherein novel means is provided for permitting manipulation of the piston cork.

A more specific object of the invention is to provide a syringe including a plunger member of novel construction which may be first advanced to inject a preparation into a patient's vein and may be thereafter partially withdrawn to indicate whether the syringe is properly positioned in the vein, after which the plunger may be advanced accurately step-by-step.

Another object of the invention is to provide a syringe which includes a novel plunger which during the first portion of its movement is free to slide forward and backward and which during the latter portion of its movement is rotated so that the rate of injection may be accurately determined.

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

Fig. 1 is a central sectional view through a syringe barrel embodying the features of my invention;

Fig. 2 is a central sectional view through a syringe rear member embodying the features of my invention;

Fig. 3 is a central sectional view showing an ampule with which my improved syringe is adapted to be used;

Fig. 4 is a section taken on line 4—4 of Fig. 1;

Fig. 5 is a longitudinal sectional view through the assembled syringe and ampule showing the syringe ready for injection;

Fig. 6 is a view similar to Fig. 5 showing the plunger partly advanced;

Fig. 7 is a view similar to Fig. 5 showing the plunger fully advanced; and

Fig. 8 is a fragmentary, extended sectional view showing a modified construction of the piston stopper and plunger.

Referring to the drawings by reference char-

acters, I have shown my invention as embodied in a syringe which is indicated generally at 10. As shown, the syringe includes a barrel 11, an ampule 12, and a rear member 13.

The ampule 12 is of the type which permits a fresh solution to be made and comprises an elongated glass tube 14 having a cork 15 in the front end thereof. The cork 15 is made of rubber and includes a front imperforate diaphragm 16 and a rear closure 17 which is held in place by the resiliency of the material. A medicinal pellet 18 is arranged within the cork 15. The ampule may be filled with distilled water or other vehicle, not shown for the medicinal pellet 18. In the rear end thereof the ampule includes a piston cork 19 having grooves 20 therein which contain lubricant such as paraffin. The front end of the cork 19 is recessed as at 21 and the rear end of the cork is shown as provided with a threaded washer 22 and with a cavity 23 in advance of the washer 22.

The barrel includes a front member 24 which supports a tube 25. The tube 25 extends into the barrel and has a closed inner end 26 and a lateral aperture 27. The front member 24 includes a tip portion 28 on which a hypodermic needle (not shown) is mounted.

At its rear end the barrel is provided with an enlarged cylindrical portion 30 which is internally threaded as at 31. A peripheral outwardly extending flange 32 on the barrel serves as a finger engaging portion.

The rear member 13 includes a cylindrical body portion 33 which has external threads 34 engaging the threads 31 on the rear end of the barrel. The portion 33 has an end closure 35 which is threaded as at 36 to engage similar threads on the body 33. The end closure 35 is screwed tightly in place to hold the part 35 against rotation relative to the portion 33. The forward end of the part 33 includes an inwardly directed portion 38 and a forwardly projecting portion 39. Centering member 40 slidably engages the parts 38 and 39. The centering member is normally urged forward by a spring 41 which engages the rear end of the centering member and the forward face of the cap 35.

An outwardly spun flange 41' limits forward movement of the centering member 40 relative to the body 33.

The forward face of the centering member 40 is beveled as at 42 so that the engagement of the end of the portion in the end of the ampule 12 centers the ampule and also urges the ampule forwardly in the barrel.

The centering member 40 is provided with an axial bore 43 through which a plunger member 44 extends. The forward portion of the plunger 44 is cylindrical and the bore 43 is of greater diameter than that of the cylindrical portion of the plunger member. The cap 35 includes an inwardly extending threaded sleeve 45 while the outer end of the plunger 44 is threaded as at 46 to match the threads 45. The threads 45 and 46 are preferably triple threads. The end of the plunger includes a thumb engaging member 47 with the end of this member arcuate as at 48 for engagement by the thumb of the operator.

The extreme forward end of the plunger 44 is threaded as at 49 to match the threads of the threaded washer 22. A flange 50 is mounted on the forward end of the plunger rod 44 at the inner end of the threaded portion 49.

In use the ampule is placed in the barrel and the rear member 13 is advanced so that the threads 31 and 34 engage. The rear member is then turned relative to the barrel. This causes the centering member 40 to engage the rear end of the ampule and urge the ampule forward in the barrel as the threads are engaged. During this operation the tube 25 pierces the front diaphragm 16 of the cork and passes through the tablet 18 and dislodges the disk 17 thus freeing the disk 17 and allowing the tablet 18 to contact and be dissolved by the water or other vehicle in the ampule.

As soon as the drug has dissolved, the operator rotates the plunger 44 causing the threads 49 on the plunger to engage the threads of the washer 22. The plunger is rotated until the flange 50 engages the rear of the cork. A needle (not shown) is then placed on tip portion 28 and is inserted in the patient. The plunger rod 44 is then moved forward for a slight distance and then is pulled back thus drawing fluid inwardly through the tube 25. If a red color appears in the ampule, this signals that the needle insertion has been properly made in the vein, and the plunger is then pushed forwardly as far as it will slide, that is, until the threads 45 and 46 are at the point of engaging. This action discharges enough anesthetizing solution to produce general anesthesia and after waiting sufficient time to allow this effect to take place, the operator at intervals turns the plunger either a half turn or one turn and this, due to the fact that the threads 45 and 46 are now engaged, causes the plunger to advance slowly step-by-step so that the injection is made step-by-step so long as it is desired to produce the general anesthesia.

When the plunger approaches the limit of its

inward movement, the recess 21 in the piston cork 19 covers the end of the tube 25 and also covers the closure 17. The tube 25 receives fluid during the injecting operation through the lateral aperture 27.

In Fig. 8 I show a modification of my invention wherein the ampule 14' is provided with a cork 19' and which is similar to the cork 19 previously described except that the cork 19' is provided with a threaded cavity 23'. The modified plunger indicated at 44' is provided with a flange 50' and with an end portion 49' which is threaded to engage the threads 23'. The operation of the modification is similar to that of the device previously described.

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

Having thus described my invention, I claim:
In an anesthetizing syringe, a barrel, an ampule in said barrel adapted to provide a fresh anesthetizing solution, a piston cork slidable in said ampule, said barrel having a front member adapted to receive a needle for injection into a patient who is to receive the anesthetizing solution, said barrel having a rear member with a threaded aperture extending therethrough, a plunger extending through said aperture, said plunger having a front end engaging said piston cork, said plunger having a non-threaded cylindrical front portion of less diameter than said threaded aperture, said plunger slidable downwardly through said threaded aperture to the extent of said non-threaded portion upon receipt of manual pressure of the user, said non-threaded front portion of said plunger of such fixed extent that when moved through said aperture the front end of the plunger is moved against said piston cork to force a predetermined amount of anesthetizing solution from the ampule out the needle and into the patient to produce general anesthesia, said plunger having a rear portion with threads extending to its rear end, said threads of a size adapted to engage the threads of said threaded aperture, the threads of said aperture and of said plunger being uninterrupted, so that as said plunger is given a desired turn from time to time by the user the plunger is moved down against the piston cork to force a small predetermined required amount of the anesthetizing solution from the ampule out the needle and into the patient to continue the general anesthesia.

ARTHUR E. SMITH.