Dec. 15, 1942. A. E. SMITH 2,305,278

SYRINGE CONSTRUCTION

Filed May 5, 1939

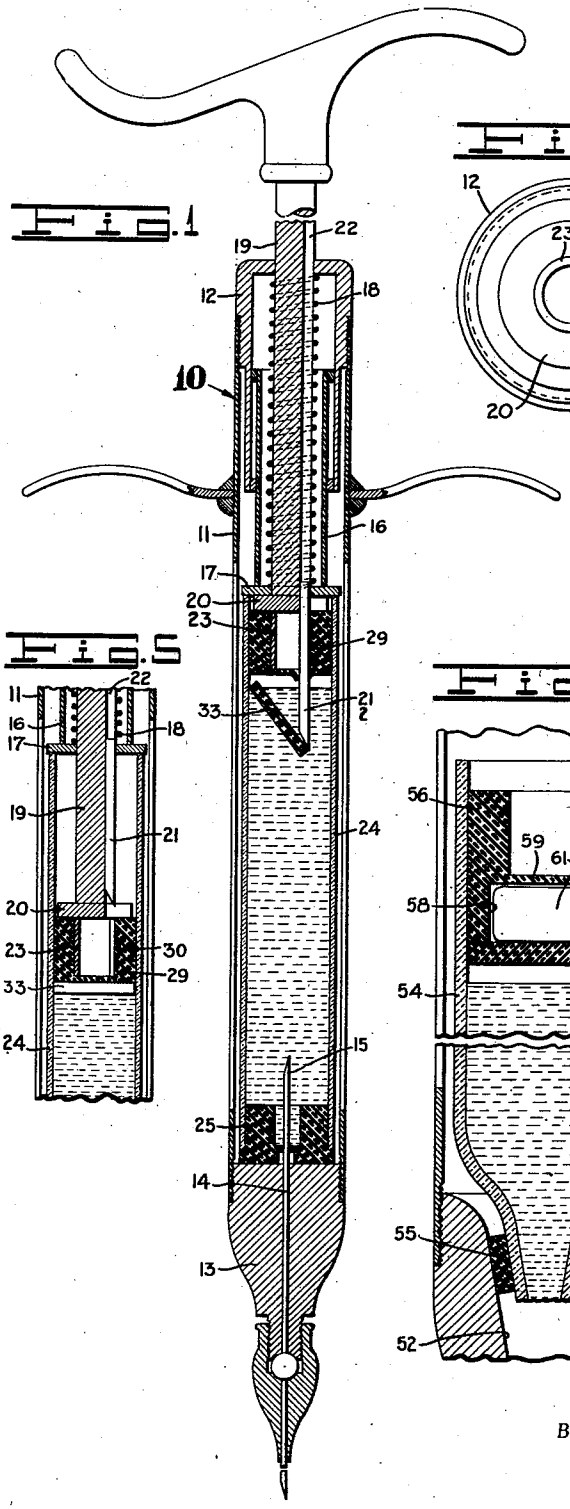


FIG. 1

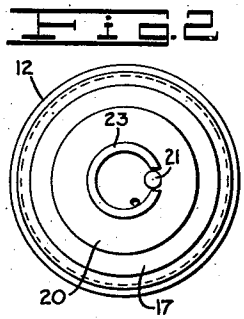


FIG. 2

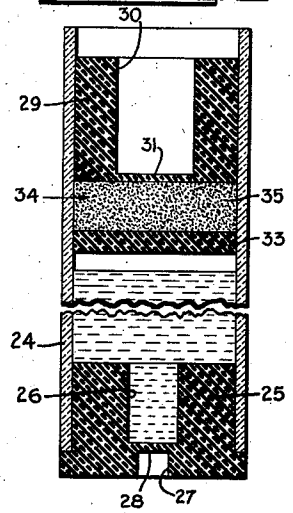


FIG. 3

FIG. 5

FIG. 7

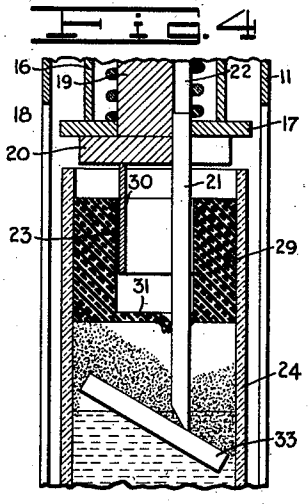


FIG. 4

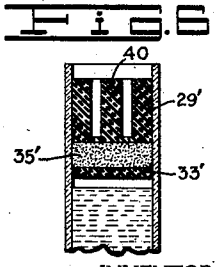


FIG. 6

INVENTOR.
Arthur E. Smith.

BY

ATTORNEY.

Patented Dec. 15, 1942

2,305,278

UNITED STATES PATENT OFFICE

2,305,278

SYRINGE CONSTRUCTION

Arthur E. Smith, Los Angeles, Calif.

Application May 5, 1939, Serial No. 271,887

1 Claim. (Cl. 128—272)

This invention relates to syringes.

The general object of the invention is to provide a novel ampule syringe which is particularly adapted to provide fresh solution for injection.

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

A further object of the invention is to provide a novel plunger construction for an ampule syringe.

Another object of the invention is to provide a novel ampule for a syringe.

A further object of the invention is to provide a novel stopper for use in a syringe ampule.

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

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

Fig. 2 is an end view of the rear member of the syringe;

Fig. 3 is an enlarged fragmentary central sectional view showing the ampule;

Fig. 4 is a view similar to Fig. 3 showing the parts in another position;

Fig. 5 is a view similar to Fig. 4 on a reduced scale showing the parts in another position;

Fig. 6 is a fragmentary sectional view on a reduced scale showing a modification; and

Fig. 7 is an enlarged fragmentary sectional view showing a further modification.

Referring to the drawing by reference characters I have shown my invention as embodied in a syringe which is indicated generally at 10. As shown the syringe includes a barrel 11 having a rear member 12 thereon and having a front member 13. The front member 13 is provided with an aperture which receives a needle 14 the inner end 15 of which projects into the barrel.

The rear member includes a telescopic section 16 having a head 17 thereon which is normally urged in one direction by a spring 18 which surrounds a plunger rod 19. The plunger rod 19 has a flange 20 thereon. The head 17 is provided with a needle or piercing member 21 which is arranged at one side of the axis of the head and plunger and which slides in a groove 22 in the plunger. The flange 20 includes a depending collar 23 and this collar as well as the flange 20 are notched to receive the needle 21.

Within the syringe barrel I provide an ampule 24 which may be made of glass and which includes a front resilient cork 25 having an inner chamber 26 and an outer chamber 27 with a diaphragm 28 separating the chambers and adapted to be punctured by the end 15 of the needle to allow the contents of the ampule to be discharged from the syringe.

At its rear end the ampule includes a cork 29 having a recess 30 therein with the diaphragm 31 closing the lower end of the recess. The cork 29 is preferably spaced near the rear end of the ampule and below the diaphragm 31 I show another cork or disk 33 which is so spaced that it provides a chamber 34 for a medicinal preparation 35.

All the corks are preferably made of rubber or a similar material so that they form a hermetic closure.

In use the ampule is placed in the syringe after which the rear member 12 may be turned so that the threads thereon engage the threads on the barrel to hold the rear member in place.

The head 17 on the rear member thus engages the end of the ampule while the needle point 15 passes through the diaphragm 28 into the ampule. As the head 17 moves forward the needle 21 thereon engages the cork 33 at one side of its center as shown in Fig. 4 and tilts this cork allowing the liquid contents in the main part of the ampule to communicate with the area between the corks 29 and 33 so that the ingredients may mix to form a fresh solution.

After the ingredients are mixed, pressure on the plunger causes the flange 20 thereon to move the corks 29 and 33 downwardly leaving the needle 21 and allowing the hole produced by the needle to be closed. In this way the contents of the ampule are ejected.

The recess 30 and the cork 29 allow the needle 21 to enter at any location about the periphery of this recess.

In Fig. 6 I show a modification wherein a cork 29' which is similar to the cork 29 is used in conjunction with a cork 33' similar to the cork 33. A medicinal compound 35' is disposed between the corks. The cork 29' differs from the cork 29 in that the former includes a central portion 40 which is integral with the body of the cork. The use of the ampule shown in Fig. 6 is similar to that previously described.

In Fig. 7 I show a further modification of the invention wherein the front member 51 of the syringe includes a tapered recess 52 to receive the tapered front end 53 of an ampule 54. A gasket 55 serves to maintain the parts in sealing relation. At its upper end the ampule 54 includes a cork 56 having a recess 57 and 58 at the opposite ends, the recess 57 being separated by a diaphragm 59. A second cork or disk 60 closes the lower end of the recess 58. A medicinal prep-

aration 61 is contained in the chamber afforded by the recess 58.

In use the ampule 54 is inserted in the syringe as previously described and the syringe rear member which is similar in all respects to the rear member 12 is employed. The needle on this rear member pierces the diaphragm 59 and engages the disk 60 at one side of its center to unseat the disk and allow the preparation 61 to pass into the vehicle.

From the foregoing description it will be apparent that I have invented a novel syringe and ampule which are highly efficient for the intended purpose.

Having thus described my invention, I claim:

In an ampule, a body cylindrical throughout and having a cork therein at one end thereof, said cork including a thin portion adapted to be punctured by a needle, a second cork in the other end of said ampule, each of said corks sealingly engaging the ampule wall, said second cork having an outwardly opening aperture therein adapted to receive a piercing member and having a diaphragm closing the inner end of said aperture and puncturable by a piercing member passing through said aperture, a third cork in said ampule sealingly engaging the ampule wall, said third cork comprising a thin, tiltable disk and being spaced from the second cork to form a chamber, a medicinal preparation in said chamber, each of said corks being cylindrical, and a solvent for the medicinal preparation in the ampule between the first and third corks, said second cork being slidable in the ampule and means to prevent inward movement of the first cork in the ampule.

ARTHUR E. SMITH.