

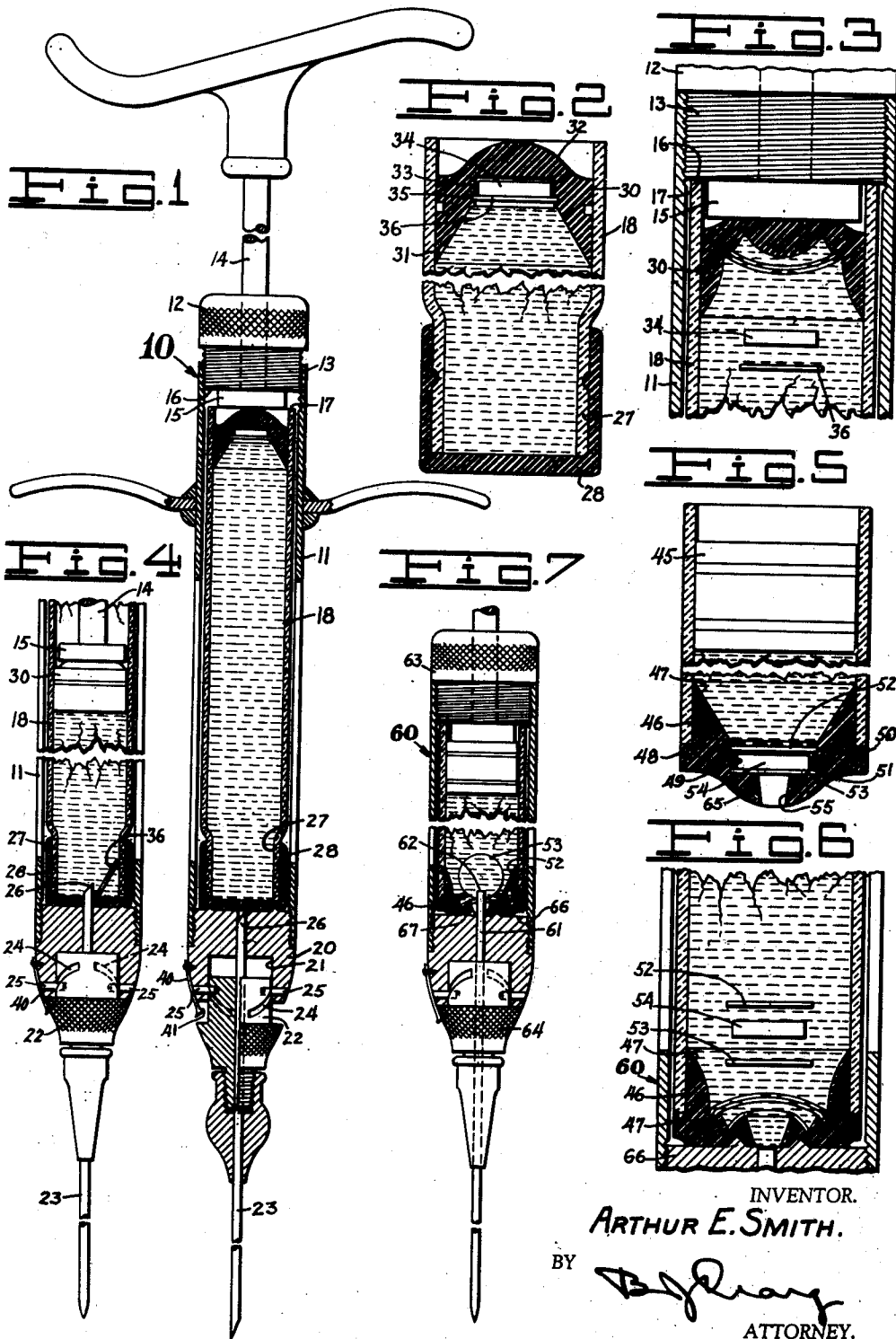
Nov. 9, 1937.

A. E. SMITH

2,098,524

SYRINGE

Filed April 3, 1935



INVENTOR.
ARTHUR E. SMITH.

BY

W. H. Ray
ATTORNEY.

UNITED STATES PATENT OFFICE

2,098,524

SYRINGE

Arthur E. Smith, Los Angeles, Calif.

Application April 3, 1935, Serial No. 14,499

4 Claims. (Cl. 128—218)

This invention relates to syringes.

The general object of the invention is to provide a new ampule syringe which is of such nature that it can be used for a local anaesthesia, and other purposes, and wherein novel means is provided to prepare a fresh solution directly within the ampule.

A further object of the invention is to provide a novel syringe barrel and end member therefor.

Another object of the invention is to provide an improved ampule closure.

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

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

Fig. 2 is an enlarged fragmentary central sectional view showing the improved ampule;

Fig. 3 is a view similar to Fig. 2 showing the plunger on the syringe in the act of causing the medicinal tablet to be ejected into the fluid in the ampule;

Fig. 4 is a fragmentary central sectional view showing the parts in a different relation;

Fig. 5 is a view similar to Fig. 2 showing a modified form of ampule closure;

Fig. 6 is a fragmentary central sectional view showing the modified ampule in Fig. 5 and parts of the syringe; and,

Fig. 7 is a fragmentary central sectional view showing the syringe and modified form of ampule closure.

Referring to the drawing by reference characters I have shown my invention as embodied in a syringe indicated generally at 10. As shown this syringe includes a barrel 11 having an end closure 12 thereon which is threaded as at 13 and which fits the threads on the end of the barrel. The closure 12 is provided with a plunger 14 which has a head 15 thereon and the closure includes a lower portion 16 which is adapted to engage the upper edge 17 of the ampule 18 shown as arranged in the barrel.

The front end of the barrel is provided with a front member 20 which is threaded to the barrel and which includes a recess 21 in which an end member 22 is slidably mounted. This end member 22 has a needle 23 thereon and the cylindrical portion is provided with a slot 24 into which pins 25 on the front member 20 extend. The slots 24 are curved so that as the end member 22 is rotated it is withdrawn from or advanced into the front member 20. The needle 23

as shown includes sharpened portion 26 which in its inner position is within the barrel of the syringe, as shown in Figure 4.

The ampule 18 at one end is shown as provided with a reduced portion 27 on which an elastic rubber cap closure 28 is mounted. When the ampule is in the barrel and when the parts are in the position shown in Fig. 4, the point 26 of the needle pierces the closure 28 to afford communication between the interior of the ampule and the needle. The rear of the ampule is engaged by the lower end of the closure 12, as shown in Fig. 3, when the parts are in operating position.

In the end of the ampule remote from the closure cap 28, I provide a rubber closure 30 which includes a body portion having an inwardly directed skirt 31, the lower portion of which is shaped to form a feather edge and the upper portion of which is provided with a protuberance 32. The closure 30 is provided with a chamber 33 in which a medicinal preparation 34 shown in the nature of a tablet is inserted. The wall of the chamber 33 is provided with a peripheral groove 35 in which is a disk 36, which may be made of celluloid, and which is seated in the groove and which may be tightly held in place by the resiliency of the closure to thus protect the medicinal preparation 34 from the liquid in the ampule.

In operation, the ampule is inserted in the syringe barrel as shown in Fig. 1. The rear member 12 is then screwed down to engage the end of the ampule and as it does this the plunger 14 strikes the protuberance 32 and forces this protuberance downwardly into the ampule. The elasticity of the rubber from which the closure 30 is made causes the walls defining the chamber 33 to flare outwardly thus releasing the disk and allowing the medicinal tablet to drop into the liquid in the ampule. After this is done the end member 22 may be rotated causing it to advance in the front member 20 and causing the needle point 26 to pierce the wall of the closure 28 and thus prepare the syringe for use.

To hold the front member in its inner position I may provide a clip 40 which has a tongue 41 thereon which fits a corresponding aperture in the front member 20.

In the modification shown in Figs. 5, 6 and 7 the rear closure is an ordinary cylindrical stopper 45 while the front closure 46 includes a body having a tapering inner skirt 47 and having a flange 48 which engages the end of the

ampule. The closure is provided with a chamber 49 which has a pair of spaced grooves 50 and 51 therein. In these grooves, disks 52 and 53 are resiliently seated. Between the disks 52 and 53 I arrange a medicinal preparation in the form of a tablet 54 and outwardly from the disk 53 I provide an aperture 55. The syringe 60 shown in Fig. 7 is similar to the syringe 10 except that the needle 61 is provided with a blunt end 62.

In use, the ampule is placed in the barrel with the blunt end 62 engaging the disk 53. The end member 63 is then placed in position so that it engages the end of the ampule and forces the opposite end of the ampule and the protuberance 65 against the front member 66 of the syringe. This causes the protuberant portion to move inwardly thereby releasing the disks and at the same time effecting a tight seal for engagement with the peripheral bead 67 on the front member of the syringe. After this is done the front portion 64 is rotated so that the blunt end of the needle 62 enters the ampule. In case the disks have not been completely unseated the blunt end 62 of the needle will cause this unseating.

From the foregoing description it will be apparent that I have invented a novel syringe and ampule which can be economically manufactured and which is highly efficient in use.

Having thus described my invention, I claim:

1. An ampule comprising a cylindrical body having a movable closure at one end, a fixed closure at the other end, one of said closures including a resilient body having a peripheral wall engaging said ampule and having a chamber therein, a depressible protuberance on said closure outwardly of said chamber and in alignment therewith, a preparation in said chamber,

and a disk forming the outer wall of said chamber, said disk being resiliently engaged by said closure whereby when the protuberance is depressed the disk is freed.

2. An ampule comprising a cylindrical body having a closure therein at one end, said closure being made of rubber and including a body having a portion engaging said ampule and having a chamber therein opening into the ampule, a disk closing said opening, a flexible portion on said closure adjacent said chamber, a preparation in said chamber, said flexible portion being depressible to expand the wall of the chamber and release said disk.

3. An ampule comprising a cylindrical body having a movable closure therein at one end, a fixed closure at the other end, one of said closures being made of rubber and including a body having a peripheral wall engaging said ampule and having a chamber therein opening into the ampule, a depressible protuberance on said closure and projecting outwardly, a preparation in said chamber, and a disk resiliently engaging the wall of said chamber, said protuberant portion being depressible to expand the wall of the chamber and release said disk.

4. An ampule comprising a cylindrical body having a movable closure at one end, a fixed closure at the other end, one of said closures including a resilient body having a peripheral wall engaging said ampule and having a chamber therein, a depressible protuberance on said closure outwardly of said chamber, a preparation in said chamber and a seal forming the outer wall of said chamber, said seal being resiliently engaged by said closure whereby when the protuberance is depressed the seal is freed.

ARTHUR E. SMITH.