June 29, 1943. A. E. SMITH 2,323,159

SYRINGE

Original Filed May 5, 1939

FIG. 1

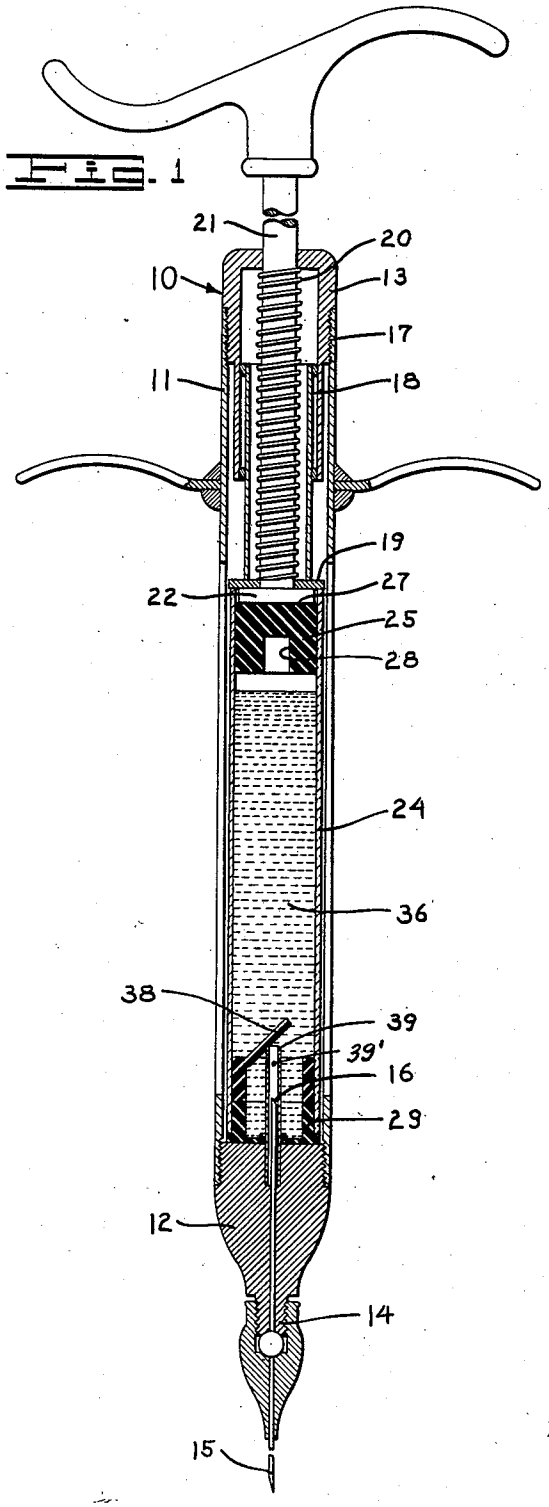


FIG. 2

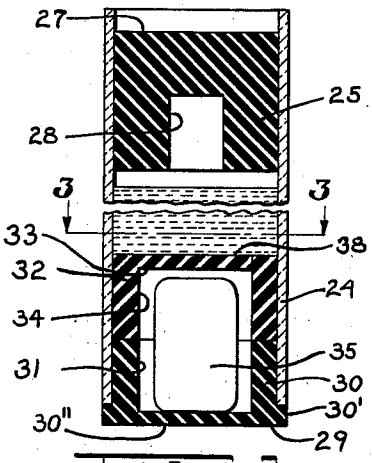


FIG. 3

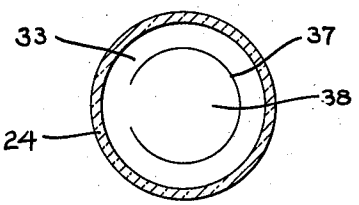
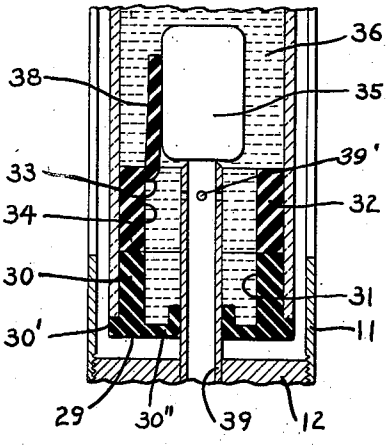


FIG. 4



INVENTOR.
ARTHUR E. SMITH

BY

ATTORNEY.

Patented June 29, 1943 2,323,159

UNITED STATES PATENT OFFICE

2,323,159

SYRINGE

Arthur E. Smith, Los Angeles, Calif.

Original application May 5, 1939, Serial No. 271,886. Divided and this application January 15, 1940, Serial No. 313,906

2 Claims. (Cl. 128—218)

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.

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 a fragmentary central sectional view through an ampule embodying the features of my invention;

Fig. 3 is a section taken on line 3—3, Fig. 2; and

Fig. 4 is a fragmentary sectional view showing the tablet being discharged.

This application is a division of my copending application Serial No. 271,886 filed May 5, 1939, now Patent No. 2,271,720 patented Feb. 3, 1942.

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 one piece 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.

An ampulse embodying the features of my invention 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 engaging the 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 outer resilient element 30 having an outer flange 30′ and having an end wall 30″ and having a recess 31 therein which opens inwardly and a second element 32 having an inner wall 33 forming a recess 34. The corks 25, 30 and 32 may be made of rubber or other suitable 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 inner wall 33 is severed on a line 37 (see Fig. 3) 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.

The front member 12 includes a tube or piercing needle 39 which extends inwardly and which receives the inner end 16 of the needle 15. The tube 39 is provided with an opening or openings 39′ through which the fluid 36 may pass to the needle 15.

In use the ampule is placed in the barrel 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 25 which serves as a piston and is adapted to be moved by the flange 22 when the plunger is pressed as will be readily understood.

As the rear member 13 is moved to position, the member 39 pierces the lower wall 30″ 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. As the plunger is moved inwardly, the cork 25 moves inwardly thus forcing the contents of the ampule through the needle 15.

With the construction including the trap door a hermetic seal is provided with the rubber of the trap door member having a cushioning sealing engagement with the adjacent portion of the cork so that a tight seal is maintained but which is readily broken when the syringe is operated.

Having thus described my invention, I claim:

1. In a syringe, a barrel having a front member thereon, a needle on the front member and extending into the barrel, a tube on the front member and surrounding the needle and projecting beyond the needle into the barrel, said tube having a lateral opening therein disposed within the barrel, an ampule in the barrel, said ampule having a resilient cork therein, said cork having a diaphragm at the outer end thereof and adapted to be punctured by the tube, said cork having a recess and a trap door closure for the recess and adapted to be displaced by said tube, said trap door being integral with the

cork, said trap door having a peripheral sealing fit within the cork and being normally held in sealing position by the resiliency of the cork material.

2. In a hypodermic syringe, a hollow barrel, a plunger slidable in said barrel, a hollow member projecting into the barrel, an ampule in said barrel, said ampule having a cork therein adjacent one end, said cork comprising an inner and an outer element, both of said elements being resilient and fitted 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 hollow member, the inner cork element being disposed adjacent to the outer cork element and forming a chamber in conjunction with the outer cork element, said inner cork element having a closure for the chamber, said closure being partially severed from the inner element by a curved line of severance which is spaced from the outer periphery of the inner cork element to provide a trap door, the periphery of the trap door being normally held in fluid tight engagement against the inner periphery of the inner cork element wall by the resiliency of the material of the trap door and by the resiliency of the inner cork element and being adapted to be displaced, a medicinal preparation between said inner and outer elements, a member closing the other end of the ampule, and a vehicle for the drug between the other end closure and the inner cork element.

ARTHUR E. SMITH.