Jan. 30, 1945. A. E. SMITH 2,368,432

FRONT LOADING SYRINGE

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Fig. 1

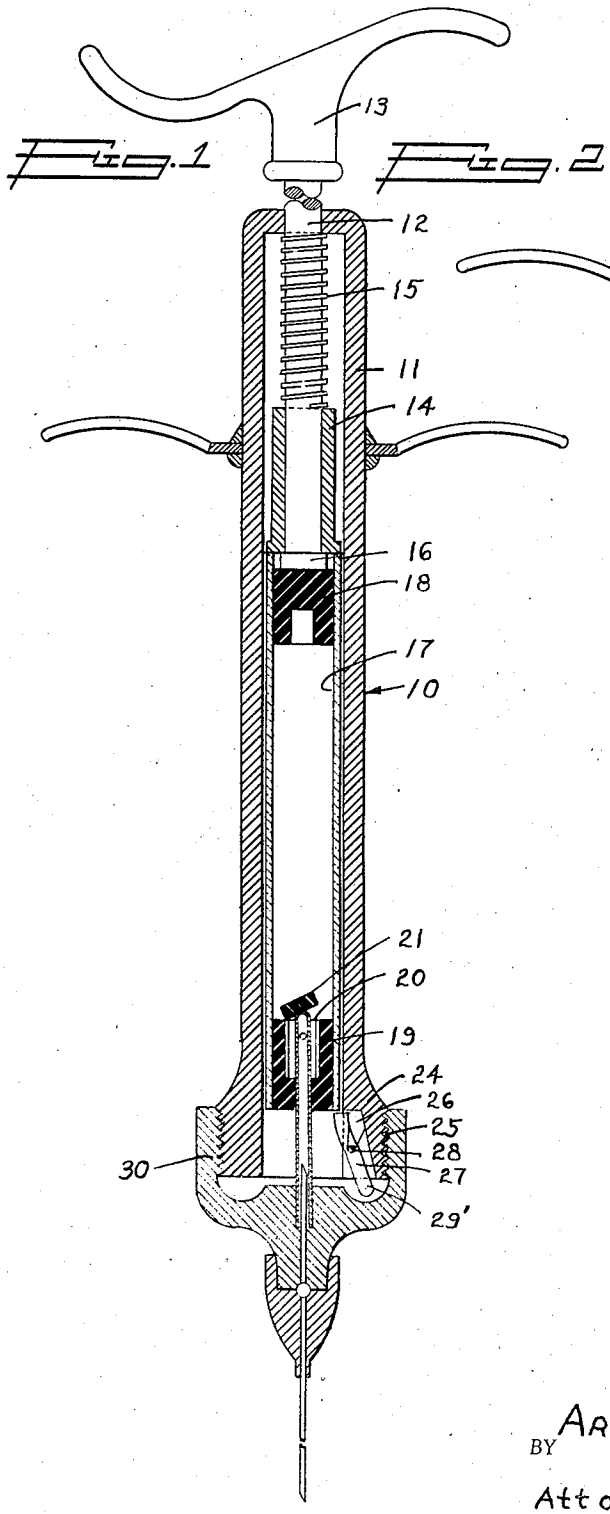
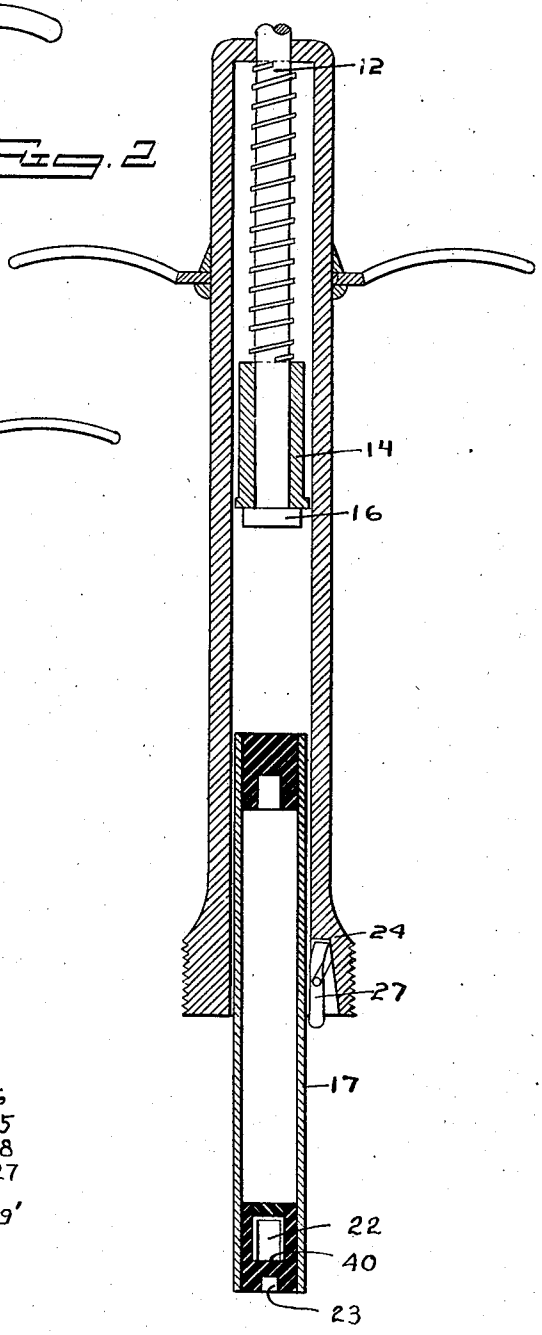


Fig. 2



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Fig. 3

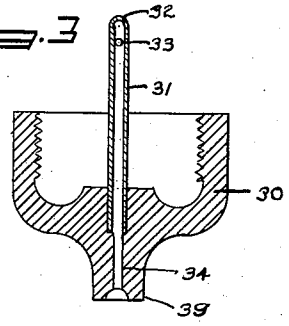


Fig. 4

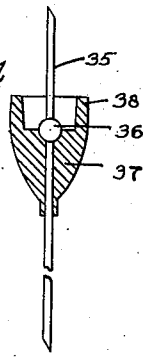


Fig. 5

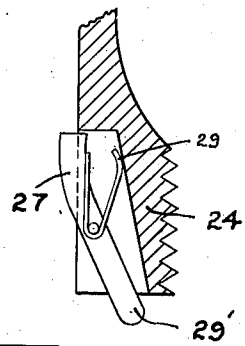


Fig. 6

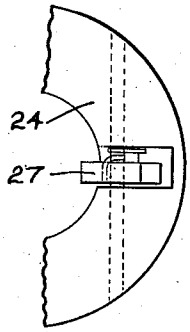


Fig. 7

Fig. 8

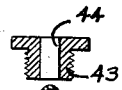


Fig. 9

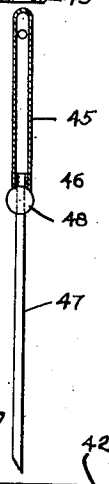
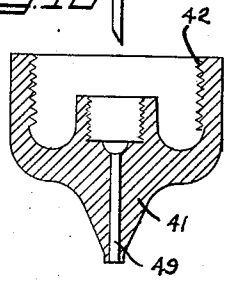


Fig. 10



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Patented Jan. 30, 1945 2,368,432

UNITED STATES PATENT OFFICE

2,368,432

FRONT LOADING SYRINGE

Arthur E. Smith, Los Angeles, Calif.

Application June 23, 1944, Serial No. 541,684

8 Claims. (Cl. 128—218)

This invention relates to a syringe device.

The general object of the invention is to provide a novel front loading, ampule type syringe.

A more specific object of the invention is to provide a syringe of the ampule holding type wherein novel means is provided for securing an ampule in the syringe barrel.

Another object of the invention is to provide a novel front member for an ampule holding syringe.

Other objects and the 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, with parts in elevation, showing a syringe embodying the features of my invention;

Fig. 2 is a view similar to Fig. 1, with the front member removed and showing an ampule being loaded into the barrel;

Fig. 3 is a central, sectional view of the front member;

Fig. 4 is a central, sectional view of the tip with a needle therein;

Fig. 5 is an enlarged, fragmentary, sectional view of the front end of the barrel, showing the mounting for the ampule holding dog;

Fig. 6 is a fragmentary front view of the syringe barrel;

Fig. 7 is a view similar to Fig. 1, showing a modification;

Fig. 8 is a central, sectional view, showing the plug member which serves to hold the needle in place;

Fig. 9 is a central, sectional view, partly in elevation, showing the ampule opening member and needle, and

Fig. 10 is a central, sectional view, showing the front member.

Referring to the drawings 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 in which a plunger 12 is reciprocated by means of a finger engaging member 13. About the plunger I arrange a sleeve 14 which is normally urged inwardly in the barrel by a spring 15.

The plunger has a head 16 which is of a size to fit within an ampule 17 while the sleeve 14 is of a size to engage the end of the ampule 17.

The ampule may be made of any suitable material, such as glass or plastic, and is provided with an upper cork 18 which is in the nature of a piston and with a lower cork 19 which has a cavity 20 closed by a displaceable plug 21. In the cavity 20 I arrange a medicinal preparation 22. The front end of the cork 19 is preferably provided with a recess 23.

The corks and disc 21 may be made of a good grade of rubber or similar material and the preparation 22 may be a drug such as Novocaine which is to be placed in solution in a liquid vehicle in the ampule 17 just prior to use so that a fresh solution may be provided.

The front end of the barrel 11 is provided with a thickened portion 24 which is threaded as at 25. The portion 24 includes a longitudinally extending slot 26 in which a dog 27 is pivotally mounted on a pin 28. A spring 29 normally urges the dog to the position shown in Figs. 1 and 5.

In use an ampule is inserted in the front end of the barrel as shown in Fig. 2 and is moved inwardly, depressing the dog 27 until the ampule end clears the dog, whereupon the latter will move to the position shown in Fig. 1. When in this position movement of the outer end 29' of the dog will cause the ampule to be released, whereupon it will be urged outwardly from the barrel by means of the action of the sleeve 14 and spring 15. Thus it is unnecessary to remove the ampule from the barrel by hand.

The forward end of the syringe is provided with a front member 30 which threadedly engages the threads on the barrel 24. This member 30 is provided with a tube 31 which is shown as having a closed end 32 and one or more lateral apertures 33 by means of which communication is established between the interior and exterior of the tube. The tube 31 is arranged in the member 30 coaxial with a bore 34 in the member 30 and in this bore I fit the inner end 35 of a tube and a hypodermic needle which has a sealing ball 36 thereon and which engages a tip 37 which has a flange 38 which engages the extreme end 39 of the front member 30 to hold the parts assembled.

In use the ampule is inserted as shown in Fig. 2 and is moved inwardly until it assumes the position shown in Fig. 1. Thereupon the member 30 is moved into place and as it does so the end 32 of the tube enters the slot 23 and pierces the diaphragm 40 in advance of the slot 23 and causes the disc 21 to be unseated, thus discharging the medicinal preparation 22 into the ampule. The member 37 may be mounted on the member 30 either before or after the latter is placed on the barrel 11.

In Figs. 7 to 10, inclusive, the barrel and ampule are the same as previously described but the front member 41 is different in that it includes an internally threaded collar 42 which receives a threaded plug 43 which has a bore 44 therein. The bore 44 receives a tube 45 similar to the tube 31 previously described. This tube is secured to the upper end 46 of a needle 47 with a sealing ball 48 arranged at the juncture of the tube and needle. In use the needle 47 is inserted through a bore 49 in the front member 41 and the member 43 is then secured in place. Thereafter the assembly is mounted upon the syringe barrel as shown in Fig. 7.

From the foregoing description it will be apparent that I have invented a novel front load-

ing syringe which is extremely simple in construction and which is highly efficient for its intended purpose.

Having thus described my invention, I claim:

1. A syringe, including a barrel having a plunger therein, a dog movably mounted on said barrel and including a portion adapted to engage an ampule in the barrel, said dog being shiftable to release an ampule in the barrel, and a front member mounted on said barrel.

2. A syringe, including a barrel having a plunger therein, means to urge the plunger forward in the barrel, means on the plunger adapted to engage an ampule in the barrel, a front member, coacting means on the front member and barrel for releasably mounting the front member on said barrel, said front member having an inwardly projecting fluid conducting member mounted thereon adapted to communicate with the interior of an ampule in the barrel.

3. A syringe, including a barrel, an ampule in said barrel, said ampule having a cork at the front end, said cork having an inwardly opening cavity with a medicinal preparation therein, a shiftable closure closing the inner end of said cavity, a dog movably mounted on said barrel and including a portion adapted to engage an ampule in the barrel, a front member mounted on said barrel, said front member having an inwardly projecting tube thereon communicating with the interior of the ampule and a needle communicating with the interior of the tube.

4. A syringe, including a barrel having a plunger therein, a sleeve slidable on the plunger and adapted to advance to engage an ampule in the barrel, resilient means normally holding the sleeve in advanced position, a dog pivotally mounted on the forward end of said barrel and including an inner end portion adapted to engage and hold an ampule in the barrel, said dog having a portion projecting beyond the forward end of the barrel for engagement by an operator to shift the dog to release an ampule in the barrel, resilient means normally urging the dog to ampule engaging position, a front member mounted on said barrel, said front member having an inwardly projecting tube thereon adapted to communicate with an ampule in the barrel and a needle on the front member and communicating with the interior of the tube.

5. A syringe, including a barrel, an ampule in said barrel, said ampule having a piston cork at the rear end and having a second cork at the front end, said second cork having an inwardly opening cavity with a medicinal preparation therein, a shiftable closure closing the inner end of said cavity, a dog pivotally mounted on said barrel and including an inner end portion adapted to engage and hold an ampule in the barrel, said dog having a portion projecting beyond the forward end of the barrel for engagement by an operator to shift the dog to release an ampule in the barrel, resilient means normally urging the dog to ampule engaging position, a front member mounted on said barrel, said front member having an inwardly projecting tube thereon communicating with the interior of the ampule and a needle communicating with the interior of the tube.

6. A syringe, including a barrel having a plunger therein, a sleeve slidable on the plunger and adapted to engage an ampule in the barrel, resilient means normally holding the sleeve in ampule engaging position, an ampule in said barrel, said ampule having a piston cork at the rear end and having a second cork at the front end, said second cork having an inwardly opening cavity with a medicinal preparation therein, a shiftable closure closing the inner end of said cavity, said barrel having a slot therein, a dog pivotally mounted in said slot and including an inner end portion adapted to engage and hold an ampule in the barrel, said dog having a portion projecting beyond the forward end of the barrel for engagement by an operator to shift the dog to release an ampule in the barrel, resilient means normally urging the dog to ampule engaging position, a front member mounted on said barrel, said front member having an inwardly projecting tube thereon communicating with the interior of the ampule and a needle communicating with the interior of the tube.

7. A syringe, including a barrel having a plunger therein, a sleeve slidable on the plunger and adapted to engage an ampule in the barrel, resilient means normally holding the sleeve to ampule engaging position, an ampule in said barrel, said ampule having a piston cork at the rear end and having a second cork at the front end, said second cork having an inwardly opening cavity with a medicinal preparation therein, a shiftable closure closing the inner end of said cavity, said barrel having a thickened forward end and having a longitudinally extending slot in the thickened portion, a dog pivotally mounted in said slot and including an inner end portion adapted to engage and hold an ampule in the barrel, said dog having a portion projecting beyond the forward end of the barrel for engagement by an operator to shift the dog to release an ampule in the barrel, resilient means normally urging the dog to ampule engaging position, a front member mounted on said barrel, said front member having an inwardly projecting tube thereon and having a bore communicating with the interior of said tube, said tube having an aperture affording communication between the interior and exterior thereof, and a needle mounted on the front member and extending into the front member bore and communicating with the interior of the tube.

8. A syringe, including a barrel having a plunger therein, a sleeve slidable on the plunger and adapted to engage an ampule in the barrel, resilient means normally holding the sleeve in ampule engaging position, an ampule in said barrel, said ampule having a piston cork at the rear end and having a second cork at the front end, said second cork having an inwardly opening cavity with a medicinal preparation therein, a shiftable closure closing the inner end of said cavity, said barrel having a thickened forward end and having a longitudinally extending slot in the thickened portion, a dog pivotally mounted in said slot and including an inner end portion adapted to engage and hold an ampule in the barrel, said dog having a portion projecting beyond the forward end of the barrel for engagement by an operator to shift the dog to release an ampule in the barrel, resilient means normally urging the dog to ampule engaging position, a front member mounted on said barrel, a tube, means to hold the tube on the front member, said tube projecting into the barrel, said tube having an aperture affording communication between the interior and exterior thereof, and a needle on the front member and communicating with the interior of the tube.

ARTHUR E. SMITH.