

Nov. 24, 1931.

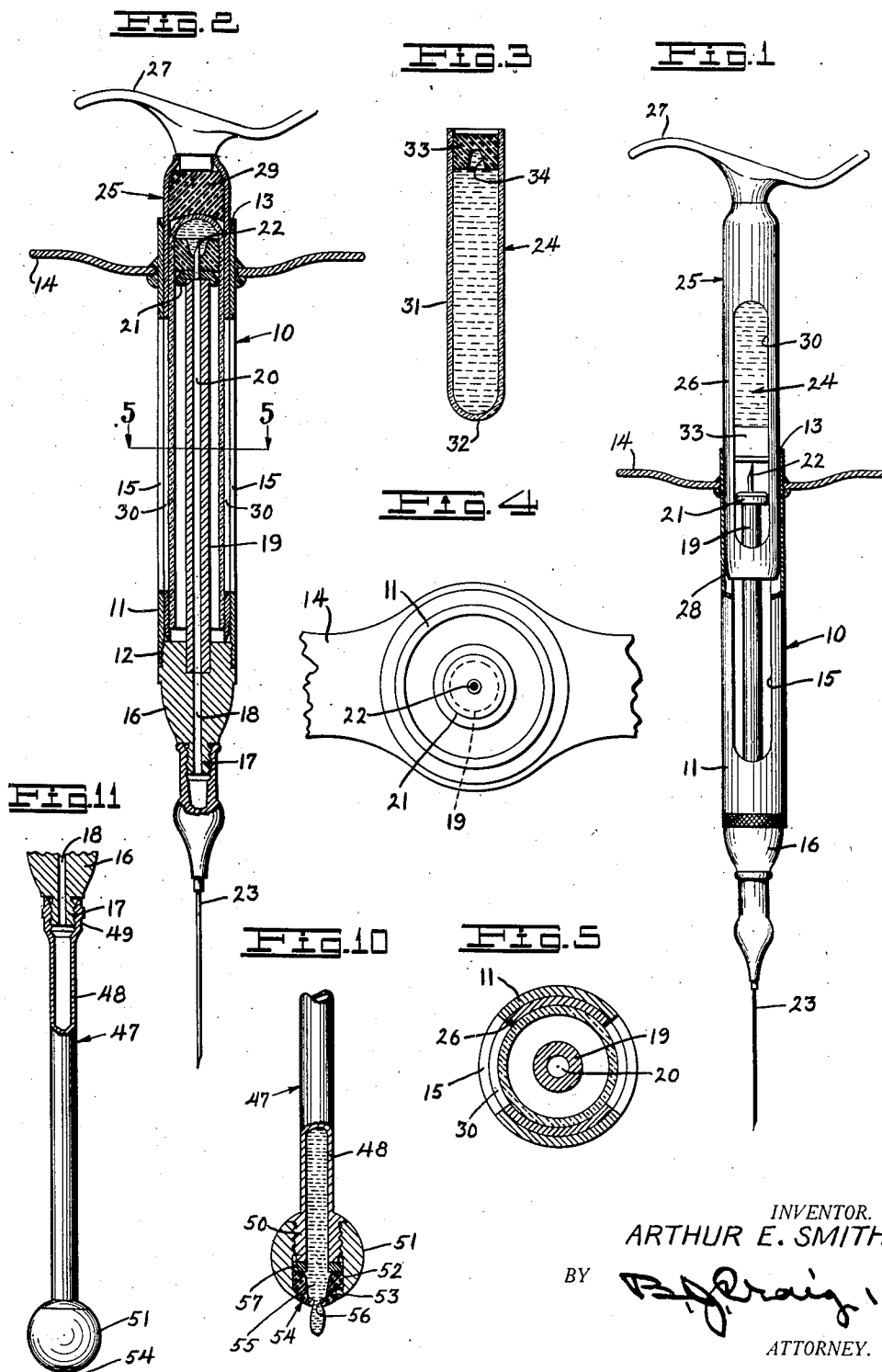
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1,833,598

SYRINGE APPLICATOR

Filed Feb. 15, 1927

2 Sheets-Sheet 1



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FIG. 6

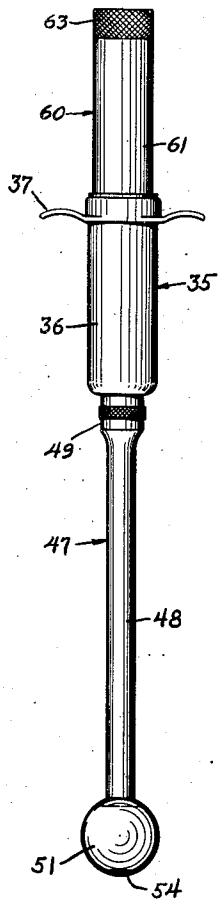


FIG. 7

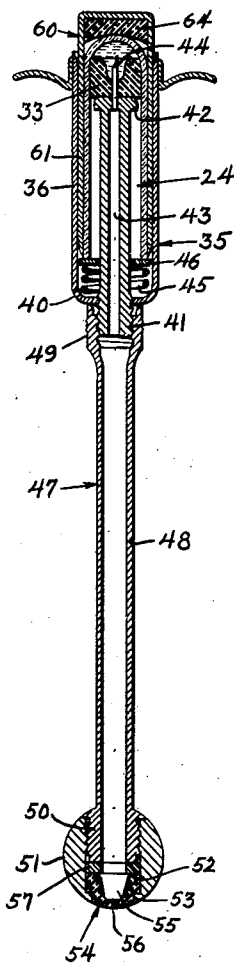


FIG. 8

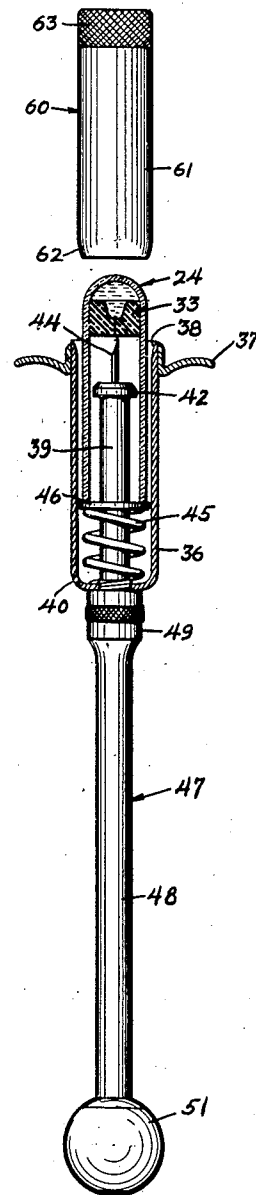
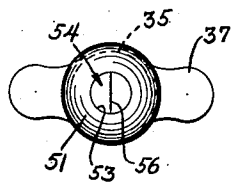


FIG. 9



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UNITED STATES PATENT OFFICE

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SYRINGE APPLICATOR

Application filed February 15, 1927. Serial No. 168,294.

This invention relates to syringe applicators.

The general object of this invention is to provide a medicinal applicator wherein the substance to be injected is contained in a cartridge-like ampule which is provided with a slidable stopper and wherein the process of injecting the various parts of the applicator coact to move the ampule and to hold the stopper stationary and thus force the contents of the ampule out through a discharge tube of the applicator.

Another object of this invention is to provide an applicator in which a cartridge-like medicinal container or ampule is used wherein means is provided for partially ejecting said cartridge from the applicator when the pressure on the cartridge is removed.

An additional object of my invention is to provide a medicinal applying device including interchangeable parts enabling it to be used as a syringe or as a vaginal applicator.

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

Fig. 1 is a side elevation of my improved applicator showing an ampule therein.

Fig. 2 is an enlarged longitudinal section of my improved applicator showing the relative positions of the various parts after the applicator has been actuated to expel the contents of an ampule.

Fig. 3 is a longitudinal section of an ampule such as may be used in conjunction with my improved applicator.

Fig. 4 is an enlarged top plan view of the barrel portion of the applicator.

Fig. 5 is an enlarged section through the applicator taken on line 5—5 of Fig. 2.

Fig. 6 is an elevation of a modified form of applicator.

Fig. 7 is an enlarged longitudinal section of the modified form of applicator.

Fig. 8 is an elevation of the modified form of applicator partly in section showing the ampule holder removed and the ampule partially ejected from the barrel after the pressure on said ampule has been removed.

Fig. 9 is a view of the discharge end of the modified applicator.

Fig. 10 is a longitudinal sectional view of the discharge end of the modified applicator showing the contents of an ampule being discharged therethrough, and

Fig. 11 is a fragmentary detail partly in section showing my improved injector.

Referring to the drawings by reference characters I have indicated an applicator embodying the features of my invention at 10. This applicator comprises a hollow body portion or barrel 11 having screw threads 12 provided at one end and having its other end beveled as at 13. Adjacent one end of the barrel 11 a cross bar 14 is provided and in the barrel 11 equally spaced elongated slots 15 are provided.

A tip 16 in threaded engagement with the threads 12 of barrel 11 is provided. The tip 16 has a reduced screw threaded end 17 and is provided with an aperture 18 there-through. A discharge tube 19 is provided in the tip 16 and may be rigidly secured thereto by soldering, or in any other suitable manner. The discharge tube 19 has a hole 20 therethrough in line with the aperture 18 of the tip 16.

The discharge tube 19 is provided with a head 21 which has a hollow needle 22 secured thereto and projecting therefrom. An injecting device such as a hypodermic needle 23 may be secured to the end 17 of tip 16 by screw threaded engagement.

A holder 25 is arranged for sliding movement within the barrel 11 and is adapted to receive an ampule 24 therein. The ampule holder 25 (best seen in Fig. 1) comprises a hollow tubular body 26 provided at one end with a handle 27 and having the outer surface at its other end beveled as at 28. A cushioning member 29 is provided in the body 26 at the end adjacent the handle 27 and elongated equally spaced apertures 30 are provided in the body.

The ampule 24 which I prefer to use in conjunction with my improved applicator is preferably made of glass and comprises a hollow tubular body 31 closed at one end as at 32 and provided with a stopper 33 at

the other end. The stopper 33 is preferably made of rubber and preferably has a recess 34 provided therein in its inner face.

When one desires to use my improved applicator 10 for making an injection the ampule holder 25 is withdrawn from the barrel 11 and an ampule, such as the ampule 24, is slipped into the body 26 of the ampule holder so that the closed end 32 of the ampule abuts the cushioning member 29. The ampule holder is then inserted in the barrel 11 and moved therein towards the tip 16. As the ampule 24 is moved towards the tip 16 by the ampule holder the stopper 33 is penetrated by the needle 22 of the discharge tube 19 and the head 21 of the discharge tube abuts the stopper 33. Upon a further movement of the ampule holder the stopper 33 will be forced by the head 21 to slide within the ampule towards the closed end 32 of the ampule, and thus act as a piston to force the contents of the ampule out through the needle 22, through the discharge tube 19 and into the hypodermic needle 23.

The elongated apertures 15 in the barrel and the elongated apertures 30 in the body 26 of the ampule holder 25 form viewing apertures by means of which the operator may observe to what extent the contents of the ampule have been removed.

In Figs. 6 to 10 inclusive I have indicated at 35 a modified form of applicator which is of the same general construction as the applicator previously described. This applicator 35 is particularly adapted for injecting medicinal compounds into the vagina in the treatment of female diseases such as catarrhal inflammations, vaginitis, cervicitis, leucorrhea, gonorrhea, etc.

The more common drugs which may be employed in using my invention are boro-glycerin, ichthyol-glycerin, mercurochrome, and other semi-viscous medicinal compounds. This modified form of applicator 35 comprises a barrel 36 having a grip or cross bar 37 provided adjacent one end thereof. One end of the barrel 36 is open and has its inner surface beveled outward as at 38, while the other end is closed and has a discharge tube 39 projecting therethrough and permanently secured thereto by soldering or in any other suitable manner. The barrel 36 has a bleed aperture 40 provided therein shown adjacent the closed end.

The discharge tube 39 is screw threaded at one end thereof as at 41 and has a head 42 provided at its other end. An aperture 43 extends through the discharge tube 39 to the head 42 which has a hollow pointed needle 44 firmly secured therein and communicating with the aperture 43. Within the barrel 36 and surrounding the discharge tube 39 I show an ejector spring 45 resting on the closed end of the barrel and having a washer

46 soldered or otherwise secured on its movable end.

The screw threaded end 41 of the discharge tube 39 is adapted to receive an injecting device such as shown and indicated at 47. The injector 47 comprises a hollow tubular stem 48 having an enlarged end 49 internally threaded for attachment to the screw threaded end 41 of the discharge tube 39. The other end of the hollow tubular stem 47 is shown as being enlarged as at 50 and externally threaded for attaching thereto a globular portion or knob 51. The knob 51 has an aperture 52 therein and an aperture 53 extending from aperture 52 through the knob.

Within the apertures 52 and 53 I mount an automatic valve 54. The valve 54 is preferably made of rubber and has a recess 55 provided therein and has a slit 56 extending from the recess 55 through the valve. Also mounted in the aperture 52 I show a valve retaining washer 57.

I have shown an ampule holder at 60 as adapted for telescopic engagement with the barrel 36. The ampule holder 60 comprises a hollow tubular body 61 closed at one end and having its outer surface beveled inwardly at its open end as at 62. The closed end may be provided with gripping means such as knurling 63. Within the body 61 and abutting the closed end thereof, a cushioning member 64 is provided. The cushioning member 64 is preferably a disc of yieldable rubber having a concave inner surface. The same type of ampule 24 may be used with this modified applicator as shown and described in Fig. 3.

When an injection is to be performed with the modified applicator 35 the ampule 24 is inserted into the ampule holder 60 so that the closed end 32 of the ampule abuts the cushioning member 64 in the ampule holder. The ampule holder is then inserted into the barrel 36 and moved therein towards the closed end thereof.

As the ampule 24 is moved towards the discharge tube 39 by the ampule holder the stopper 33 is penetrated by the needle 44 of the discharge tube, and the head 42 of the discharge tube abuts the stopper 33. Upon a further movement of the ampule the stopper 33 will be forced by the head 42 to slide within the ampule towards the closed end 32 of the ampule and thus act as a piston to force the contents of the ampule out through the hollow needle 44, through the discharge tube 39 and into and through the injector 47.

As the contents of the ampule is forced through the stem 48 and into the recess 55 of the valve 54 the pressure will open the slit 56 and allow the contents of the ampule to pass therethrough as shown in Fig. 10.

When the pressure on the ampule holder 60 and the ampule 24 has been removed the slit

56 will again resume its normal closed position and cut off the flow of the ampule contents. Also when the pressure is removed from the ampule holder and the ampule, the spring 45 in the barrel 36 will partially eject the ampule from the barrel and withdraw the needle 44 from the ampule stopper 33 as shown in Fig. 8 of the drawings.

If desired the injector 47 may be used in conjunction with the first described applicator 10 as shown in Fig. 11, and the hypodermic needle 23 may be used in conjunction with the modified form of applicator 35. Or if desired the injector 47 may be used by attaching it to the screw threaded neck 70 of a collapsible tube 71 as shown in Fig. 12.

When the injector 47 is attached to the collapsible tube and pressure is placed on the tube the contents of the latter will pass through the hollow stem 48 and out through the valve 54 previously described.

From the foregoing description it will be apparent that I have provided a novel form of applicator which is adaptable for various forms of injection and which is simple to operate and highly efficient in use.

What I claim is:—

1. A syringe of the character described comprising a barrel, a member slidable in said barrel and adapted to contain a stoppered ampule, another member rigid in said barrel and movable within said ampule adapted to engage the stopper of said ampule, said rigid member having an aperture therein and being provided with a hollow needle communicating with said aperture, said needle being adapted to penetrate the stopper in the ampule, relative movement of said rigid member and said ampule container being adapted to expel the contents of said ampule through said needle on said rigid member and means in said barrel normally urging said ampule from said barrel.

2. In an applicator, a barrel, an injector detachably secured to one end of said barrel, means to hold an ampule within said barrel, means to place said injector in communication with the interior of an ampule, means to force the contents of an ampule through said injector, said injector comprising a hollow tubular member having an enlarged portion at the end thereof, said enlarged portion having an aperture therein and an automatic closure means in said aperture.

3. In an applicator, a barrel, an injector detachably secured to one end of said barrel, an ampule holder adapted to slide within said barrel, said ampule holder including a hollow tubular body adapted to engage the outer surface of an ampule, a discharge tube arranged within said barrel communicating with said injector and adapted to fit within an ampule, said discharge tube and said ampule holder being adapted to coact to expel the contents of an ampule through said dis-

charge tube into said injector, said injector comprising a hollow tubular member having an enlarged portion at the end thereof, said enlarged portion being provided with an aperture, and an automatic closure means in said aperture.

4. A syringe including a barrel having an open end to receive an ampule, a cylindrical ampule slidable in said barrel, said ampule having an open end and having a cork therein, a member rigid on said barrel and movable within the ampule in the barrel, means on said member adapted to engage and penetrate the stopper of the ampule, means enabling said member to expel the contents of said ampule and means tending to force the ampule from the barrel.

In testimony whereof, I hereunto affix my signature.

ARTHUR E. SMITH.