

July 1, 1924.

H. C. DEANE

1,499,508

HYPODERMIC SYRINGE

Filed April 7, 1923

Fig. 1.

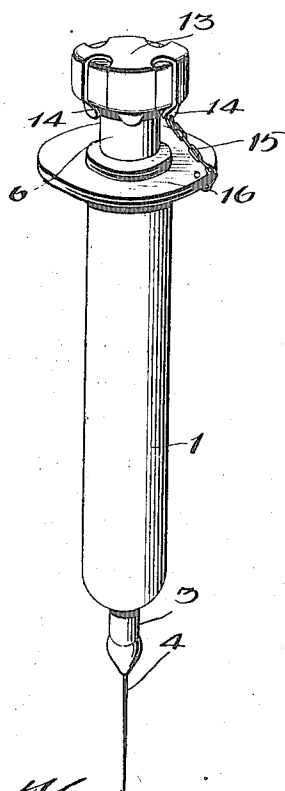


Fig. 2.

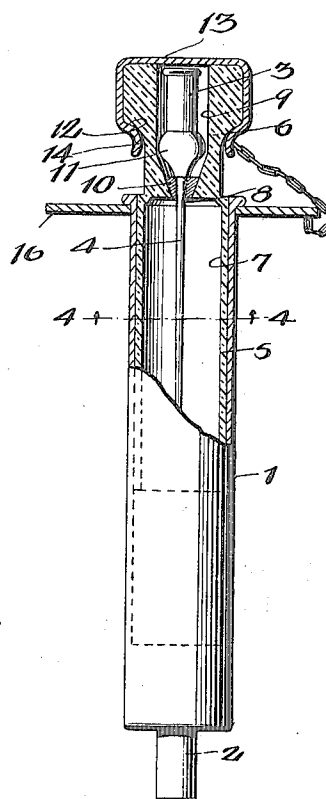


Fig. 3.

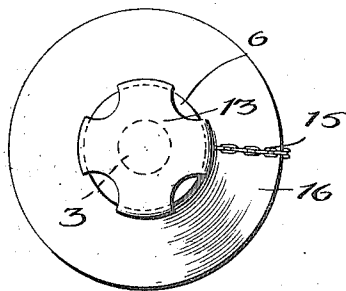
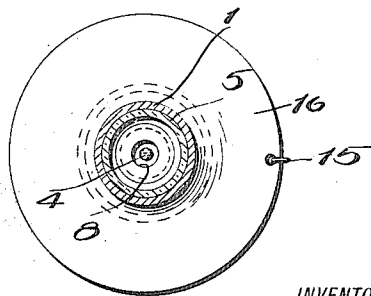


Fig. 4.



WITNESSES

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Patented July 1, 1924.

1,499,508

UNITED STATES PATENT OFFICE.

HERBERT C. DEANE, OF SHOSHONE, IDAHO.

HYPODERMIC SYRINGE.

Application filed April 7, 1923. Serial No. 630,526.

To all whom it may concern:

Be it known that I, HERBERT C. DEANE, a citizen of the United States, and a resident of Shoshone, in the county of Lincoln and State of Idaho, have invented certain new and useful Improvements in Hypodermic Syringes, of which the following is a specification.

My invention relates to improvements in hypodermic syringes and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of the invention is to improve the construction of syringes of that type having the barrel and the plunger thereof made of a readily frangible material, such as glass, so that a syringe embodying my invention will afford facilities for holding the needle immersed in a non-corrosive aseptic fluid confined within a chamber in the syringe plunger when the needle is not in use, the needle aiding when in position in the chamber of the plunger in preventing escape of the aseptic fluid from the plunger and in preventing contamination of the aseptic fluid.

A further object of the invention is to provide a syringe of the character described which is of simplified construction and which affords convenient and thoroughly practical facilities for carrying the needle in a sterile condition when not in use.

Other objects and advantages will be apparent from the following description, considered in conjunction with the accompanying drawings, in which—

Figure 1 is a perspective view showing a hypodermic syringe embodying the invention with the needle valve in position for use.

Figure 2 is a relatively enlarged view partly in side elevation and partly in vertical section, showing the needle disposed in a chamber formed in the plunger of the syringe,

Figure 3 is an end view of the syringe, and Figure 4 is a section along the line 4—4 of Figure 2.

Referring now to the drawings, I show a syringe having a barrel 1 which is made of glass and is open at one of its ends, being provided at its opposite end with a discharge nozzle 2 over which the cap portion 3 of the usual needle 4 is adapted to fit. An elongated plunger 5 which also is made of glass or other non-oxidizable material, is adapted to slide in the bore of

the barrel 5 and is provided at its outer end with an integral handle portion 6 which protrudes from the barrel at all times.

The plunger 5 is hollow, being formed with an axial chamber 7 therein extending part of the length of the plunger and being closed at its inner end. The chamber 7 communicates at its outer end through an axial opening 8 of relatively restricted area with an axial bore 9 which extends through the handle portion of the plunger. The walls of the bore 9 converge from a point intermediate the length of the bore to the opening 8, thus providing a tapering seat at the inner end of the bore 9. A plug 10 made of a suitable compressible material, such as rubber, may be pressed inwardly against the seat or tapering inner end portion of the bore 9 to position to close the latter at its inner end and thus prevent communication between the bore 9 and the chamber 7. It therefore will be apparent that a suitable non-corrosive aseptic fluid may be confined within the chamber 7 and will be free from the influence of any extrinsic elements which might contaminate the fluid within the chamber.

The bore 9 is adapted to receive the cap portion 3 of the needle when the latter has been disengaged from the discharge nozzle 2 and placed within the plunger in the position illustrated in Figure 2. In placing the needle in this position, the stopper 10 is pierced by the shank of the needle which is forced through the stopper until the shank of the needle is disposed within the chamber 7 while the cap portion of the needle is disposed within the bore 9. The relatively large intermediate portion 11 of the needle will engage with the tapering portion of the bore 9 to hold the needle in centered relation in respect to the plunger 5 so that the point of the needle is not likely to be injured because of contact with the walls of the chamber 7. When a non-corrosive aseptic fluid is placed within the chamber 7 prior to the closing of the inner end of the bore 9 and the insertion of the needle in the chamber 7 in the manner described, the needle will be kept in a sterile condition and ready for instant use. The walls of the perforation made in the stopper when the needle is inserted will engage with the walls of the needle to prevent leakage of the fluid from the chamber through the perforation made by the needle.

The handle 6 of the plunger is enlarged in diameter adjacent to its outer end and an annular shoulder 12 is thus defined at the inner end of the enlargement. A cap 5 13 fits the enlarged outer end portion of the plunger and is provided with a plurality of inwardly extending spring clamping arms or lugs 14 which are adapted to be flexed outwardly when the cap is placed 10 in position and to then spring inwardly into engagement with the shoulder 12 whereby the cap 13 will be securely and removably held on the plunger handle in closing relation to the bore 9 at the outer end 15 of the latter. When the cap 13 has been displaced from the plunger handle to permit insertion or removal of the needle, it is held against accidental loss by a flexible connection 15 secured at one of its ends to 20 one of the lugs 14 and at its other end to a flange 16 which is mounted upon the barrel 1 at the open end of the latter.

From the foregoing description of the various parts of the device, the operation 25 thereof may be readily understood. The needle may be used repeatedly in the usual manner and when not in use may be kept in a thoroughly sterile condition within the plunger in the manner described. The 30 needle itself acts as a portion of the closure for the outer end of the chamber within the plunger when positioned within the latter and no threaded connections are employed in providing the means which have 35 been hereinbefore described for holding the needle immersed in an aseptic fluid when the needle is not in use. Since no threaded connections are employed, the invention is peculiarly well adapted for embodiment in 40 a syringe having the plunger made of a non-oxidizable, readily frangible material, such as glass, in which parts having screw threaded portions, as heretofore employed in syringes of which I am aware, cannot 45 be satisfactorily used.

Obviously, my invention is susceptible of embodiment in forms other than that illustrated in the accompanying drawings and I therefore consider as my own all 50 modifications and adaptations of the form of the device herein disclosed which fairly fall within the scope of the appended claims.

Having thus described the invention, what I claim is:—

55 1. In a syringe, a plunger hollow for part of its length and being open at one end thereof, a stopper closing the hollow plunger at a point adjacent to the open end of the latter, said stopper being made 60 of a material adapted to be pierced by the needle of the syringe, and a spring cap engageable with the plunger at the open end of the latter for retaining the needle within the plunger.

2. In a syringe, a plunger having a 65 handle portion at one end thereof, said plunger being provided with an axial chamber and said handle portion being formed with a bore in axial alignment with said chamber and communicating with the latter 70 through an opening of restricted area, a closure disposed in the bore of the plunger handle at the inner end of the latter, said closure being made of a material which is adapted to be pierced by the needle of the 75 syringe, and a cap for the outer end of the plunger handle, said cap and said closure cooperating to prevent any appreciable axial movement of the needle within the plunger. 80

3. In a syringe, an elongated plunger made of a readily frangible material and being provided with an integral handle 85 portion at one of its ends, said plunger being provided with an axial chamber closed at its end remote from the handle portion and said handle being formed with a bore in axial alignment with the chamber 90 of the plunger and communicating with the latter through an opening of restricted area, the walls of the bore converging for part 95 of the length of the latter toward said opening, a closure engaging with the convergent walls of the bore to close the latter at its inner end, said closure being made of a material capable of being pierced by 100 the needle of the syringe, and a cap fitting the outer end of the plunger handle and having spring lugs adapted to engage with the outer wall of the plunger handle to releasably hold the cap against displacement from the plunger handle.

4. In a syringe, an elongated plunger made of a readily frangible material and being provided with an integral handle 105 portion at one of its ends, said plunger being provided with an axial chamber closed at its end remote from the handle portion and said handle being formed with a bore in axial alignment with the chamber of the 110 plunger and communicating with the latter through an opening of restricted area, the walls of the bore converging for part of the length of the latter toward said opening, a closure engaging with the convergent 115 walls of the bore to close the latter at its inner end, said closure being made of a material capable of being pierced by the needle of the syringe, a cap fitting the outer end of the plunger handle and having 120 spring lugs adapted to engage with the outer wall of the plunger handle to releasably hold the cap against displacement from the plunger handle, a barrel in which the plunger works, and a flexible connection 125 between the cap and the proximate end of the barrel.

HERBERT C. DEANE.