

Oct. 5, 1926.

1,601,709

W. E. ANDERSON

RETAINABLE NEEDLE CONSTRUCTION FOR SYRINGES

Filed Jan. 28, 1924

Fig. 1.

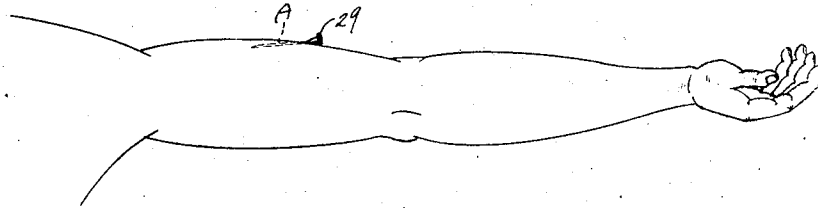


Fig. 2.

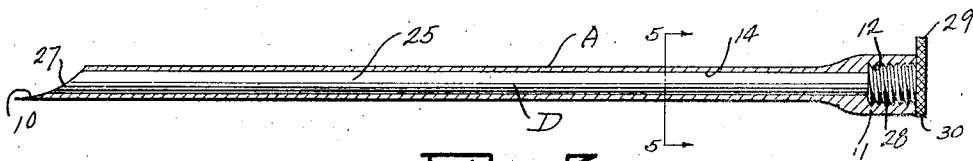


Fig. 3.

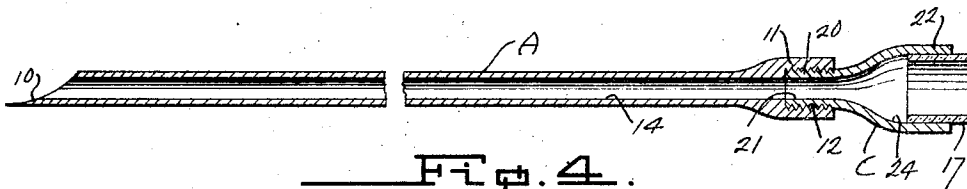


Fig. 4.

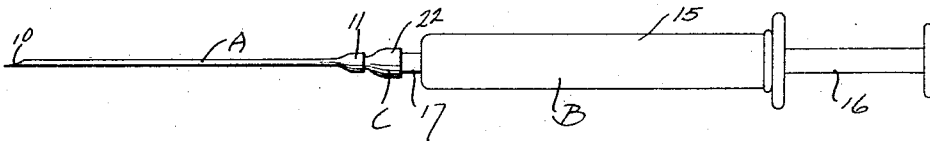
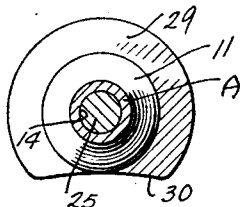


Fig. 5.



Windom E. Anderson ^{Inventor}

By *Amos A. Alvord* Attorney

UNITED STATES PATENT OFFICE.

WINDOM EDWARD ANDERSON, OF BUFFALO, NEW YORK.

RETAINABLE NEEDLE CONSTRUCTION FOR SYRINGES.

Application filed January 28, 1924. Serial No. 689,120.

This invention relates to improvements in needles used in hypodermic medication.

The primary object of this invention is the provision of an improved needle construction for therapeutic use, which is particularly well adapted for subcutaneous, intramuscular, and intravenous injections, embodying means which will permit the needle to remain in position for a considerable period of time, according to the treatment desired.

A further object of this invention is the provision of a needle of the above mentioned character adapted to be used in hypodermic medication, which embodies a needle structure readily detachable with respect to a syringe, and embodying means by which the needle structure after intravenous or intramuscular injection may remain in position in the bodily tissues in a strictly aseptic condition, for an indefinite period of time, without liability of the same permitting the formation of a blood clot or embolus, and without permitting admission of air to the flesh or vein opening.

A further and important object of this invention is the provision of a needle structure of the above mentioned character which may be used in the treatment of diseases or for other reasons, in which it is necessitated that numerous injections or blood extractions be made; the improved needle by virtue of features hereinafter outlined reducing the necessity for repeatedly needling the patient.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views.

Figure 1 is a view showing the arm of a patient with the improved needle construction inserted into the flesh of the arm and in such position that the same may remain in an aseptic and comfortable manner.

Fig. 2 is a longitudinal cross sectional view taken through the improved needle construction, showing the relation of the parts thereof as they appear when in the subcutaneous, intramuscular, or intravenous position.

Fig. 3 is a fragmentary sectional view taken longitudinally of the improved needle construction, showing the same as connected to the end of a syringe structure.

Fig. 4 is a side elevation of the improved needle as used with and attached to a syringe.

Fig. 5 is a cross sectional view taken substantially on the line 5—5 of Figure 2.

In the drawing, wherein for the purpose of illustration is shown only the preferred embodiment of this invention the letter A may generally designate the improved needle proper, which may be connected to an ordinary syringe B, as by a connector piece C. A novel type of plunger device D is adapted to be slidably used in connection with the hollow or tubular needle A after the syringe B has been detached, and as a means for filling the bore or passageway of said needle against admission of air thereto or formation of clots or other substances therein.

With ordinary hypodermic needles the insertion and withdrawal are made almost instantaneously. However, it is recognized that there are times when the needle should be retained in position within the tissues. This can not be done with ordinary hypodermic needles. Especially where it is the practitioner's desire to administer substances such as bichloride of mercury, salvarsan, sodium iodide, and the like, frequent injections must be made, because of the fact that injections can only be made of very small quantities at any one time. Therefore, the needle which may be retained in the flesh and merely the hypodermic syringe detached therefrom is highly desirable.

In order to accomplish the above functions the needle proper A has been provided, which is of any approved material, and which has a pointed end 10 concavely cut at an acute angle to the axis of the needle, as in ordinary hypodermic needle point construction. The needle A is of uniform diameter from the pointed end 10 to the opposite end 11 which may be slightly enlarged annularly about the needle and which provides an internally screw threaded socket 12 for detachably receiving details to be subsequently mentioned. The tubular needle A is of uniform thickness from the head 11 to its pointed end and provides the passageway 14 therethrough of uniform diameter from the socket 12 to the pointed end 10.

In connection with the syringe B, which is of the conventional structure, including the body 15, reciprocating piston 16, and attachment shank 17, the connecting member

C is provided, which may be formed of any approved material, and provides the forward externally screw threaded connecting shank 20 which is tubular in shape and adapted to be screw threaded into the socket 12 so that the passageway 21 thereof aligns in a flush relation with the passageway 14 of the needle A. The connecting piece C outwardly of its screw threaded shank end 20 is annularly enlarged, providing an enlarged body 22 within which the relatively large socket opening 24 is provided for receiving the tubular shank 17 of the syringe. The shank end 17 merely has a frictional engagement within the socket opening 24.

Referring to the plunger device D the same is only used after the injection has been made or an extraction of blood accomplished, and it is used for the purpose of sealing the passageway 14 of the tubular needle A in order that the needle A may remain in its subcutaneous position. This plunger device D includes the relatively long shank 25, preferably of solid and externally smooth surfaced construction, the same being circular in cross section and adapted to fit in a snug sliding engagement within the bore 14 of the needle A. At its forward end the shank 25 is pointed by finishing this pointed end to provide a concave surface 27 disposed at an acute angle with respect to the axis of the shank 25, and which surface 27 will lie exactly flush with the end margin or surface of the point 10 of the needle A, as is illustrated in Figure 2 of the drawing, the plunger device D, of course, having been fully inserted in the needle to accomplish this result. At its opposite end the shank 25 is provided with an enlarged screw threaded plug 28 integrally formed therewith adapted to be screw threaded in the socket 12. Outwardly of the screw threaded plug 28 a finger engaging head or disc 29 may be formed rigid with the screw threaded portion 28, which may be knurled about its margin to facilitate grasp by the practitioner. This head 29 may be concavely cut away, as at 30, at one side thereof, so that the head 29 will not interfere with the comfort of the patient in whose body the injection has been made; the concave surface 30 engaging the convex surface of the limb or body of the person in which the injection has been made. This concavity 30 in the head also furnishes an index to determine the correct position of the point of the needle in the flesh of the patient, especially when an intravenous injection has been made, and it furnishes an indication of the fact that the end surface 27 of the plunger device D is flush with the point 10.

The operation of the invention is apparent. The needle A is assembled upon the syringe B by means of the connection C

prior to the making of an injection or the extraction of a bodily fluid. The needle A is then hypodermically inserted into the flesh of the patient and in the desired location, and either the injection of a substance is accomplished, or the ejection of the fluid desired. If it is desired to retain the needle A in the flesh of the patient it is merely necessary to detach the connecting piece C from its screw threaded socket end 12 in the needle, and immediately thereafter the plunger device D may be inserted in the passageway 14 of the needle. The plunger shank 25 snugly fills the passageway of the needle and prevents the admission of air to the vein or to the opening in the flesh of the patient. It can be appreciated by those skilled in the art to which this invention relates that it is highly desirable to prevent the formation of a pocket at the point end of the needle if it is desired to retain the same for any length of time in the patient. This is so because if a pocket or other irregularity occurs at the point end of the needle a clot of blood or other embolus will form in the pocket. However, since the smooth end 27 of the shank 25 lies exactly flush with the point 10 of the needle there is no liability of any such results. Air will be prevented from entering the circulation system where an intravenous injection has been made, thus reducing liability of air embolism.

From the foregoing description of this invention it is apparent that an improved needle structure for syringes has been provided which contemplates the retention of the needle in the body of the patient as long as desired. On occasions where the needle is to remain for considerable time the site of the insertion may be suitably bound with tape to prevent movement of the needle with respect to the insertion.

Various changes in the shape, size, and arrangement of parts may be made to the form of this invention without departing from the spirit of the same or the scope of the claims.

I claim:

1. In a device of the class described the combination of a flesh inserting needle having a point on one end and an internally screw threaded socket on the other end, and a plunger construction in said needle consisting of a plunger mechanism for detachable insertion in said needle consisting of an elongated shank portion having on one end thereof a screw threaded head for insertion in the screw threaded socket of said needle and at its opposite end having a point adapted to lie in a flush relation with the point of the needle when the plunger is entirely inserted in the needle passageway.

2. As an article of manufacture a tubular hypodermic needle having one end thereof

pointed and having the opposite end thereof provided with an internally-screw threaded socket, said needle from the socket end being of uniform diameter to its pointed end, and
5 a device for insertion in the passageway of said needle consisting of an elongated shank adapted to fill the passageway of said needle to entirely close said passageway and having a screw threaded head rigid on said shank
10 adapted to seat in the screw threaded socket of said needle, said shank at its end adjacent the point having a surface adapted to lie flush with the needle point surface when it is fully inserted in said needle.
15 3. As an article of manufacture a flesh inserting hypodermic needle construction comprising a tubular needle provided with a passageway therein opening at the ends of said needle, said tubular needle at the in-
20 serting end thereof being obliquely cut from one side to the other, with respect to the axis of the needle, to provide an inserting point at the side of the needle, a plunger reciprocably carried in said passageway hav-
25 ing a pointed end formed obliquely to the axis of the plunger from one side thereof to

the diametrically opposed side, and means to hold the plunger fully inserted in the needle at the forward end with the forward surface of the plunger lying exactly flush with
30 the edge of the oblique end of said tubular needle.

4. As an article of manufacture a hypodermic needle construction comprising a
35 flesh inserting tubular needle provided with a passageway therein and having an eccentric pointed flesh inserting end formed oblique to the axis of the needle from one side of the needle to the diametrically op-
40 posed side and being concaved at its edge, and a plunger adapted for snug sliding in the passageway of said tubular needle having a concaved end surface formed obliquely
45 to the axis of said plunger from one side of the plunger to the diametrically opposed side to provide a point, and means for main-
50 taining the plunger in fully inserted relation in said tubular needle so that the end inserting surface of said plunger lies exactly flush with the oblique edge of the inserting
end of the tubular needle.

WINDOM EDWARD ANDERSON.