Nov. 2, 1954 M. L. LOCKHART 2,693,183

HYPODERMIC SYRINGE BLOOD TELLTALE

Filed Oct. 10, 1951 3 Sheets-Sheet 1

Fig. 2.

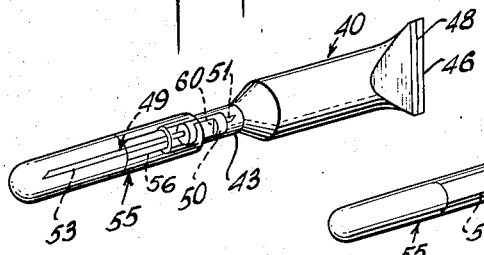


Fig. 1.

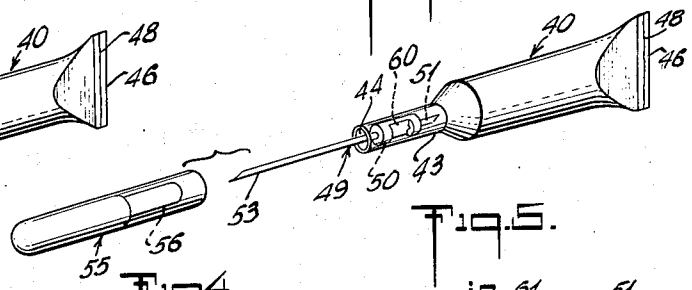


Fig. 5.

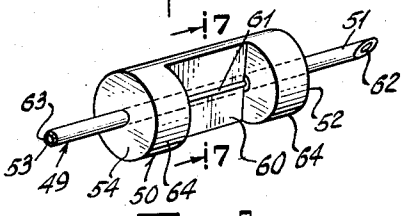


Fig. 4.

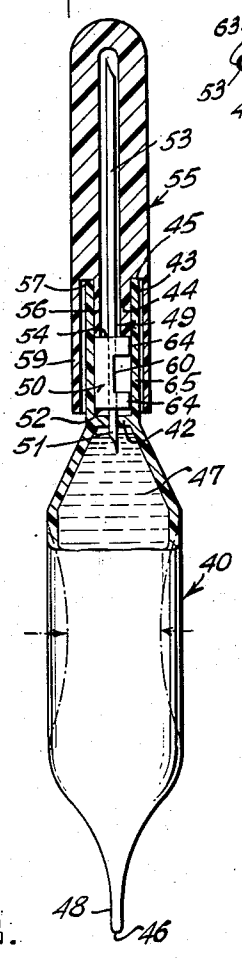


Fig. 3.

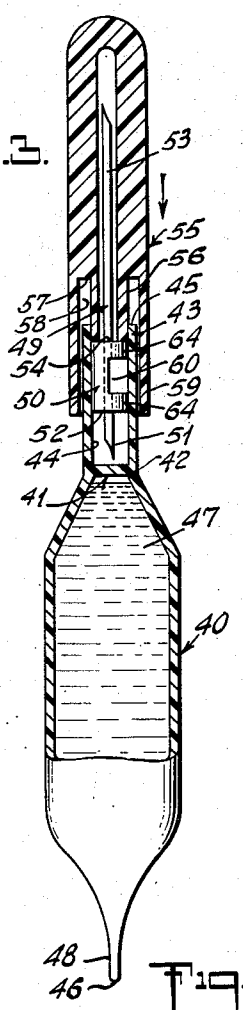


Fig. 6.

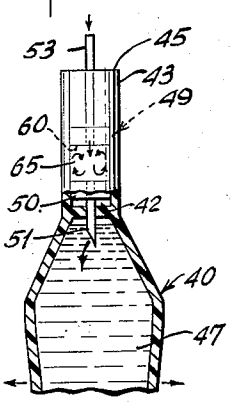


Fig. 7.

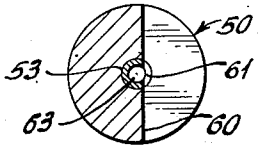
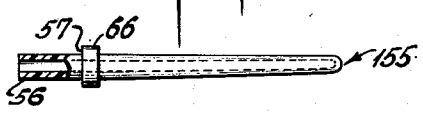


Fig. 8.



INVENTOR:
MARSHALL L. LOCKHART.
BY
Watson Johnson Leavenworth & Blair
ATTORNEYS:

Nov. 2, 1954 M. L. LOCKHART 2,693,183

HYPODERMIC SYRINGE BLOOD TELLTALE

Filed Oct. 10, 1951 3 Sheets-Sheet 2

Fig. 9.

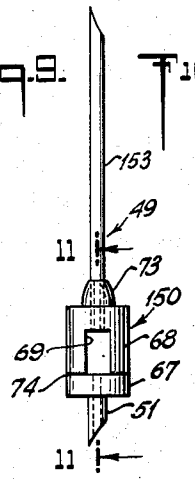


Fig. 10.

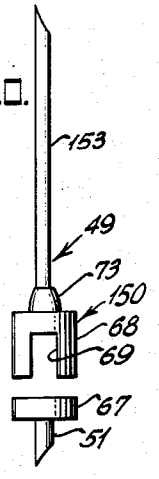


Fig. 11.

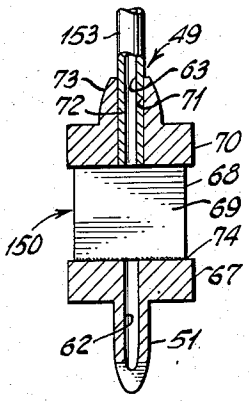


Fig. 13.

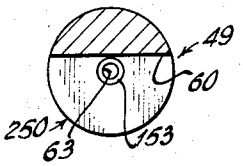


Fig. 12.

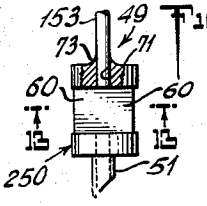


Fig. 14.

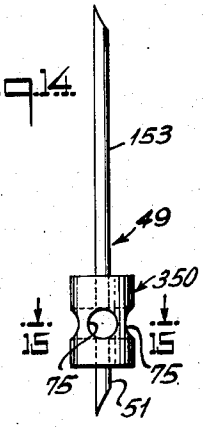


Fig. 15.

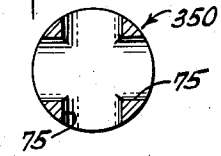


Fig. 16.

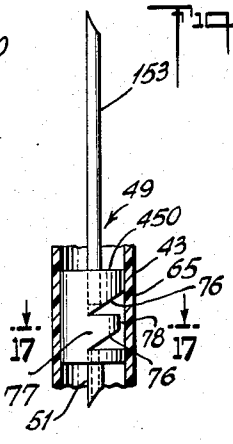


Fig. 18.

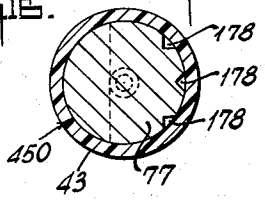


Fig. 17.

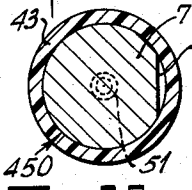


Fig. 19.

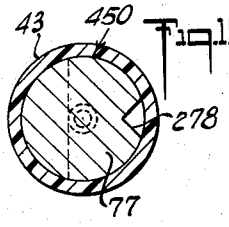


Fig. 22.

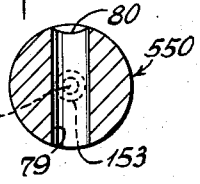


Fig. 23.

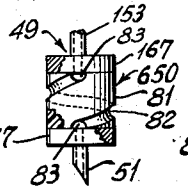


Fig. 25.

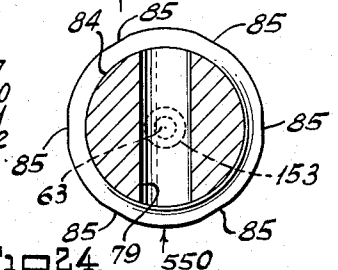


Fig. 20.

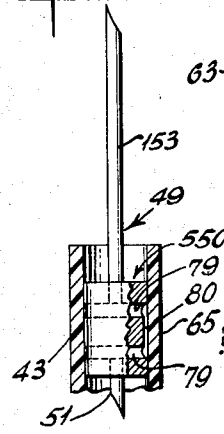


Fig. 21.

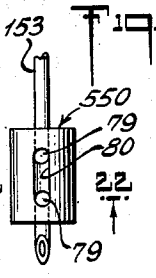
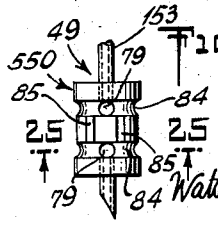


Fig. 24.



INVENTOR:
MARSHALL L. LOCKHART

BY
Watson Johnson Levenworth & Blair
ATTORNEYS:

Nov. 2, 1954 M. L. LOCKHART 2,693,183

HYPODERMIC SYRINGE BLOOD TELLTALE

Filed Oct. 10, 1951 3 Sheets-Sheet 3

Fig. 26.

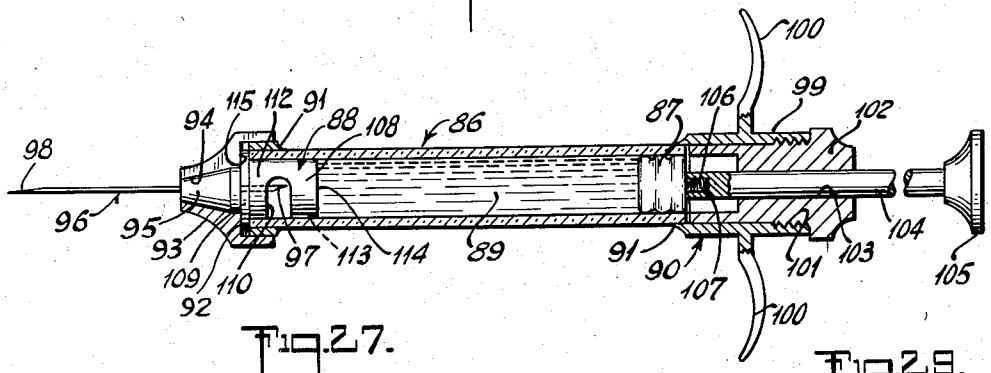


Fig. 27.

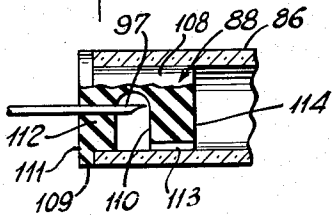


Fig. 29.

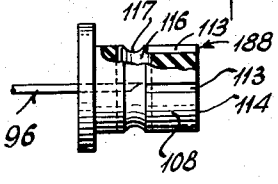


Fig. 28.

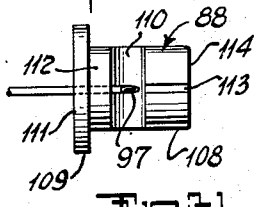


Fig. 30.

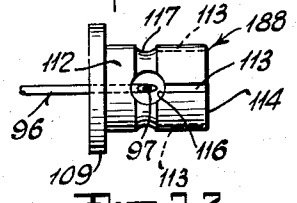


Fig. 31.

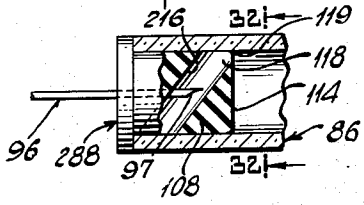


Fig. 32.

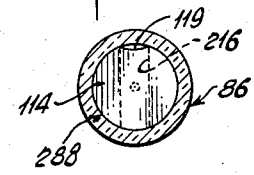


Fig. 35.

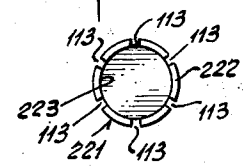


Fig. 33.

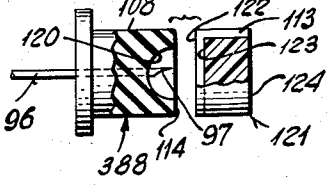
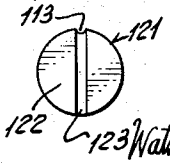


Fig. 34.



INVENTOR:
MARSHALL L. LOCKHART

BY Watson Johnson Leavenworth & Blair
ATTORNEYS:

United States Patent Office 2,693,183 Patented Nov. 2, 1954

2,693,183

HYPODERMIC SYRINGE BLOOD TELLTALE

Marshall L. Lockhart, Rutherford, N. J., assignor to The Compule Corporation, Rutherford, N. J., a corporation of New Jersey

Application October 10, 1951, Serial No. 250,703

27 Claims. (Cl. 128—216)

The present invention relates to hypodermic syringes for subcutaneous injection of barrel or ampule contents and, more particularly, to such devices equipped with means readily to provide a show of blood for ready guidance of proper subcutaneous insertion, such as that discussed in my prior Patent No. 2,556,331 of June 12, 1951.

A general object of the present invention is to provide such hypodermic syringe structures, and parts thereof, which are unusually simple in construction, readily produced on an economical basis, and easily assembled and efficiently used; and which feature means providing blood telltales effectively to assure observation of a show of blood particularly where the medicinal liquid to be injected is of a high degree of opacity or readily masks blood; embodiments of such blood telltale means being readily added to existing structures.

A more specific object of the present invention is to provide in such hypodermic syringe devices blood telltale means featuring a chamber, collecting recess or pocket adjacent a light-transmitting portion or window transparency in communication with the injecting needle bore so that blood may be aspirated through the latter to collect in that chamber or recess for ready observation, and restricted channel means in which flow of blood may be readily observed by virtue of the placement thereof immediately adjacent or in the vicinity of such observation portion or window transparency which, if desired, may be used in some embodiments to advantage with such chamber or recess.

Another object of the present invention is to provide such blood telltale means in disposable single dosage hypodermic syringes of the type illustrated in my copending application for "Single Dosage Disposable Hypodermic Springe Ampules and Assemblies," Ser. No. 202,333, filed December 22, 1950, simply by suitably notching and/or grinding or machining off portions of the needle hub of such structure in the manners taught herein.

A still further object of the present invention is to provide such telltale means which may be incorporated in a closing plug for an end of an ampule or barrel to be used in a common or well-known type of syringe construction assembly by substituting such plug for that which may be normally used for that purpose; or by simply adding a unique simple unit placeable adjacent the existing closing plug to cooperate therewith so as to provide an effective blood telltale means.

An additional object of the present invention is to provide structural embodiments of such blood telltale means and hypodermic syringe devices which are readily and economically constructed and which permit efficient use, operation and functioning thereof, as will be more fully apparent from the following descriptions of the embodiments illustrated by way of example in the accompanying drawings.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts, which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view, to a scale slightly larger than natural size, of an embodiment of the hypodermic

syringe device of the present invention, with the parts thereof, except a protective cap element, assembled relative to each other in their initial positions prior to "firing" and preceding injection use, the cap element for protectively covering the injecting needle and for "firing" being shown aligned with the needle for assembly thereover;

Fig. 2 is a perspective view similar to Fig. 1 showing the cap element protectively covering the needle and with the various parts in their relative positions as the device is intended to be distributed;

Fig. 3 is an enlarged side elevational view of the structure shown in Fig. 2 with most of the parts in axial section for a clearer understanding of the structure thereof;

Fig. 4 is a view similar to Fig. 3 showing the relative position of parts after the device has been "fired" to bring the bore of the injecting needle or cannula into communication with the interior of the ampule chamber;

Fig. 5 is an enlarged perspective view of portions of the needle and hub assembly detailing features characterizing the structure of Figs. 1 to 4 incl.;

Fig. 6 is an elevational view, with parts broken away and in section, of the top portion of the ampule, and needle and hub assembly mounted therein, showing them located in their relative "fired" positions, with the needle-protective cap element removed to permit telltale use and illustrating flow of liquid during such action;

Fig. 7 is an enlarged sectional view taken substantially on line 7—7 of Fig. 5;

Fig. 8 is a side elevational view, with a part broken away and in section, showing a modified form of needle-protective cap element;

Fig. 9 is a side elevational view of a modification of the needle and hub assembly shown in Figs. 1 to 6 incl.;

Fig. 10 is a view similar to Fig. 9 more clearly illustrating the plurality of parts which may constitute the hub unit of the structure shown in Fig. 9;

Fig. 11 is an enlarged elevational view, with most of the parts in section and with a portion of the needle broken away, of the structure shown in Fig. 9 and with that section taken substantially on line 11—11 of Fig. 9;

Fig. 12 is a view similar to Fig. 9 but with parts broken away and in section of an additional modification of the needle and hub assembly;

Fig. 13 is an enlarged sectional view taken substantially on line 13—13 of Fig. 12;

Fig. 14 is a view similar to Fig. 9 of a further modification of the needle and hub assembly;

Fig. 15 is an enlarged sectional view taken substantially on line 15—15 of Fig. 14;

Fig. 16 is an elevational view of a still further modification of the needle and hub assembly showing the same mounted in the neck portion of an ampule of the type illustrated in Figs. 1 to 4 incl. with that portion of the neck being in axial section;

Fig. 17 is an enlarged sectional view taken substantially on line 17—17 of Fig. 16;

Figs. 18 and 19 are sectional views similar to Fig. 17 of other modifications of the hub structure shown in Fig. 16;

Fig. 20 is a view similar to Fig. 16, but with parts of the hub broken away and in section, showing another embodiment of the needle and hub assembly;

Fig. 21 is an elevational view, with a portion of the needle broken away, of the Fig. 20 embodiment of the needle and hub assembly;

Fig. 22 is an enlarged sectional view taken substantially on line 22—22 of Fig. 21;

Fig. 23 is a view similar to Fig. 21, but with parts broken away and in section, of an additional embodiment of the needle and hub assembly;

Fig. 24 is a view similar to Fig. 21 of still another embodiment of the needle and hub assembly;

Fig. 25 is an enlarged sectional view taken substantially on line 25—25 of Fig. 24;

Fig. 26 is an axial section of a further embodiment of the hypodermic syringe device of the present invention showing a loaded barrel or ampule positioned in syringe structure ready for use;

Fig. 27 is an enlarged sectional view, with parts broken away, of the portion of the ampule of the Fig. 26 struc-

ture at the needle end with the bore of the needle shown in communication with the interior of the ampule;

Fig. 28 is a side elevational view of the ampule closing plug of the Figs. 26 and 27 structure showing the portion of the needle pierced through a portion of the plug for communication with an interior chamber;

Fig. 29 is a view similar to Fig. 28, but with parts of the plug broken away and in section, showing a modification of the ampule closing plug;

Fig. 30 is a view similar to Fig. 28 of the structure shown in Fig. 29;

Fig. 31 is a view similar to Fig. 27 of a still further modification of the ampule closing plug for the device of Fig. 26;

Fig. 32 is a sectional view taken substantially on line 32—32 of Fig. 31;

Fig. 33 is an exploded side elevational view, with parts broken away and in section, of an additional embodiment of the ampule-closing plug for the device of Fig. 26;

Fig. 34 is an end elevation of a part of the plug structure shown in Fig. 33; and

Fig. 35 is an end view similar to Fig. 34 of a modified form of the plug section shown therein.

Referring to the drawings, like numerals therein identify similar parts throughout. It will be seen therefrom that embodiments of the present invention and parts thereof are adapted to hypodermic syringe devices of the type disclosed in my above-identified copending application Ser. No. 202,333. Those various embodiments illustrate different ways in which blood telltales may be incorporated in hypodermic syringe devices of that nature. Thus, an embodiment of that device as illustrated in Figs. 1 to 7 incl. may take the form of a tubular structure, a main section of which provides a syringe chamber, and which may be a collapsible wall container 40 preferably in the form of a collapsible tube having relatively thin, highly flexible, elastic side walls. For this purpose container 40 preferably is made of an elastic plastic composition, such as one of the polyethylenes, since, in accordance with the present invention, at least a window or a portion of the wall of the neck of the collapsible tube must be light-transmitting, preferably transparent, in order to permit observation of a showing or flow of blood behind the window or that portion of the neck wall. Thus, the entire ampule structure constituting container 40 is preferably formed of transparent material to which purpose transparent polyethylenes are well suited.

As best shown in Fig. 3, one end 41 of the plastic tube ampule 40 is closed by a needle-pierceable diaphragm 42, preferably in the form of a flexible membrane made as an integral part of the container. A hollow neck 43 is mounted upon end 41 of container 40, and preferably is integral therewith to provide an outlet section of the tubular structure. Hollow neck 43 has a socket, preferably in the form of a cylindrical bore 44, extending longitudinally or axially thereof, closed at its inner end or bottom by diaphragm 42. The outer end 45 of the hollow neck 43 constitutes an abutment for cooperative association with certain stop means, as explained hereinafter. The container 40 preferably is molded integrally with the neck 43 and diaphragm 42 and initially has its bottom end 46 open to receive therein a charge of therapeutic fluid, such as a dosage of medicinal liquid 47. Thereafter the bottom end 46 of the tube may be closed by any suitable means, such as by pinching opposite edges together and heat-sealing it at 48, as indicated.

The hollow neck 43 carries therein a double-ended hypodermic needle or cannula structure 49, preferably slidably supported in the bore 44 by means of a body or generally cylindrical hub 50, which preferably is of slightly larger diameter than the neck bore to be frictionally held securely therein in any adjusted axial position. As shown in Figs. 1–6, inner cannula stub end 51 of the needle or cannula structure 49 projects a short distance inwardly of inner side 52 of the hub 50, with its major portion or outer end 53 extending outwardly of outer side 54 of the hub. As indicated in Figs. 2 and 3, normally the hub 50 is mounted at a certain point in the neck bore 44 so that the cannula stub end 51 extends toward but short of or is spaced outwardly of the diaphragm 42 to avoid puncture of the latter, and is temporarily held in such position by friction. By employing elastic plastic composition from which to form the ampule 40 and its neck 43, the walls of the hollow neck will have some elasticity so as to permit the desired sliding action therein of the hub 50 while assuring the frictional temporary retention in an adjusted position, especially when the hub is made of substantially rigid material, such as rigid plastic or metallic composition.

Cap element 55, preferably in the form of an elongated cup-shaped cover or capsule, is provided with the external diameter of its inner end 56 preferably slightly larger than the diameter of the neck bore 44, so as to be slidable therein but capable of being securely held frictionally in any desired position. The needle protective cap 55 may be formed of a relatively rigid plastic composition, preferably transparent to permit observation of the housed cannula and relatively shatterproof. It will be understood, however, that if made with relatively thick side walls as shown, it may be formed of a composition similar to that employed in the molding of the ampule 40 and its integral neck 43. As a result, the edge of the inner end 56 of cap 55 will abut the outer face 54 of the hub 50, and in the embodiment of the invention illustrated in Figs. 1 to 6 incl., may be employed to push the later inward or down into the bore 44, as illustrated in Fig. 4. The cap 55 is provided with suitable stop means to limit its sliding action into the bore 44, and for this purpose preferably is provided with a shoulder 57 adapted to abut against the outer end 45 of the neck 43, and may be formed as the bottom end of a circular groove 58 which forms an outer skirt 59 telescoped over neck end 45. Skirt 59 is preferably longer than reduced end 56, and may snugly engage neck 43. Of course, cap 55 is of a length sufficient to house the injecting end 53 of the cannula 49, and the stop shoulder 57 is located at a distance from the edge of the inner end 56 which will permit the hub to be slid inward into neck bore 44 far enough as to assure that the cannula stub end 51 will pierce through or puncture the diaphragm 42.

As is well known, some medicinal or therapeutic compositions are intended for intravenous injection and others for intramuscular injection. To assure proper insertion of the hypodermic injecting needle in a vein for the first type of injection, or to be certain that it is not located in a vein for the second type of injection, aspiration for a show of blood is employed, as is more fully discussed in my prior Patent No. 2,556,331 of June 12, 1951. By forming the walls of the ampule 40 of elastic material, such aspiration may be readily performed, since if relatively slight squeezing pressure on the side walls of the collapsible tube container is momentarily relieved, suction will be created to develop a show of blood at the inner end of the cannula stub 51. This practice is suitable when the liquid to be injected is clear and transparent. However, many medicinal liquid preparations are translucent or have a degree of opacity which may mask from view a show of blood at the inner end of the cannula stub 51, such as is the case with certain penicillin preparations having a milky appearance. Such difficulties are overcome effectively by the blood telltale means of the present invention.

In the embodiment of the hypodermic syringe device shown in Figs. 1 to 7 incl., such blood telltale means is provided by cutting or grinding a notch 60 into one side of the needle hub 50 deep enough to cut through a side wall of the through cannula to form an elongated slot 61 therein. As a consequence, bore 62 in cannula stub 51 and bore 63 of the injecting needle end 53, are in communication through slot 61 with notch 60, as is evident from Figs. 5 and 7. The open side of the notch 60 is effectively closed off by the light-transmitting or transparent portion of the ampule neck 43 snugly held thereagainst, as is evident from Figs. 3 and 4, so that, in effect, that notch with the associated ampule neck structure forms a closed windowed pocket, recess or interior chamber in the needle hub 50. Notch 60 defines at opposite ends of the hub 50 longitudinally-spaced lands 64, 64, which effectively close off the ends of the blood telltale pocket, recess or chamber from communication with any other space other than by way of the cannula bores 62 and 63. The remaining portions of hub 50 constitute blocking means in the hollow outlet section formed by neck 43, partially filling the interior thereof to direct flow against the transparent wall portion 65 which closes notch

60 and serves as a window, as is more fully explained hereinafter.

In operation of the hypodermic syringe embodiment shown in Figs. 1 to 6 incl., an operator may "fire" the device by depressing the cap 55 to cause it to slide the needle hub 50 forward or down into the neck bore 44 to puncture the diaphragm 42. Thus, the bore 62 of the cannula stub is brought into communication with the interior of the ampule 40 and its contents, e. g., injectable medicinal preparation 47, as indicated in Fig. 4. Due to the elasticity of the material from which diaphragm 42 is formed, the margins of the hole pierced therein by the cannula stub end 51 snugly grip the external surface thereof to provide an effective fluid-tight seal at that point. The cap 55 is then withdrawn from the neck bore 44 and the injecting end 53 of the needle is subcutaneously inserted into the patient.

The operator then manipulates the hypodermic syringe for a show of blood in the blood telltale provided by notch 60. This action is performed by squeezing opposed elastic ampule side walls inward toward each other in the direction of the arrows shown in Fig. 4 slightly to reduce the internal capacity of the ampule 40 and then by releasing them to permit them inherently to spring outwardly in the direction of the arrows shown in Fig. 6 to create suction on the needle bore 63 via the pocket 60 and the cannula stub bore 62. Upon repetition of such aspirating action, a quantity of blood will be drawn up into and collected in blood telltale pocket 60, provided the injected needle 53 has been inserted in a vein, wherein it will swirl about as it is sucked in, as is indicated by the arrows in pocket 60 in Fig. 6. Such swirling blood will be readily viewable through the window provided by the portion 65 of the transparent neck 43 in front of the notch 60. The window 65 is laterally offset from the needle bore 63 and the cannula stub bore 62, as is apparent from Figs. 3, 4 and 6. It has been found that the masking action of milky or opaque liquids is much less effective in such needle hub pocket than in a relatively large through passage or the ampule chamber proper and that such blood telltale means may be used to advantage in connection with a variety of injectable liquid preparations which have certain blood masking characteristics.

After such aspiration for a show of blood in notch 60, the contents of the ampule 40 will be hypodermically administered by expulsion with depression of the ampule side walls toward each other properly to be subcutaneously administered when intended for intravenous injection; or, if intended for intramuscular injection, after re-location of the needle in the patient's flesh, as dictated by aspiration and action of the blood telltale.

If desired, the needle-protecting cap may take the form proposed in Fig. 8 and, as there shown, may comprise a slender capsule 155 having a circumambient flange 66 providing the stop shoulder 57 at the root of the neck bore-receivable inner end 56.

As shown in Figs. 9 and 11, the needle and hub assembly 49 embodying blood telltale means of the present invention, in the form of recessed, neck or tubular section blocking means, may be provided as a three-part structure. In such embodiment, the cannula stub end 51 may be formed integral with a cylindrical plate or disc 67 to form one section of a plural part hub 150 equipped with through bore 62. A second section of the assembly of Figs. 9 and 11 may consist of another cylindrical plate or disc 68 having a transverse notch 69 cut therethrough from the end to be juxtaposed against the disc 67 up to a point leaving a circular land 70 at the other end. The section 68 has an axial bore 71 receptive of the blunt end 72 of a single-ended injecting needle 153 affixed into the bore 71 by compressing or swaging a neck 73 on that section. Section 68 may be affixed to the section 67 by any suitable means, such as soldering or welding at 74 when the parts are made of metal, or by cementing if the parts be made of rigid plastic or the like, and disc 67 closes the end of the notch 69 to transform it into a transverse slot. With such a structure, of course, opposite sides of the slot 69 are effectively closed off by opposed portions of the transparent side wall of the ampule neck 43 to provide a closed recess or pocket in which blood may be observed from opposite sides of the neck.

It is not essential that the section 67 be affixed to the section 68 of the needle and hub assembly shown in Figs. 9 and 11, as is indicated in Fig. 10, since they may be assembled in the ampule neck bore 44 in juxtaposed positions, with that section carrying the cannula stub 51 being pushed down into the neck bore by the following section 68 which in turn is engaged by the depressing cap 55. The frictional fit of the sections in the neck bore will effectively assure retention of the relative locations of the hub sections (although effective telltale action does not require retention of such juxtapositioning), and the fluid-tight seal of parts under the relatively low pressures developed in the use of such hypodermic syringe devices.

In Figs. 12 and 13 is shown a further modification of the needle and hub assemby 49 which may comprise two parts. As therein proposed, the cannula stub 51 may be made integral with the cylindrical hub 250 provided with side notch 60 which is somewhat deeper than that in the Fig. 5 structure, and with a bore 71 receiving the blunt end of single-ended needle 153 secured therein by swaged neck 73.

In the Figs. 14 and 15 structure, blood telltale means are provided which assure observation from most angles about the ampule neck. As therein proposed, the butt end of single-ended needle 153 may be secured in any suitable manner in an axial bore in cylindrical hub 350 and cannula stub 51 may be mounted in the other end of the hub in a similar fashion. The chamber is provided in the hub 350 by a pair of intersecting cross bores 75, 75 in communication with the bores of the needle 153 and cannula stub 51. Cross bores 75, 75 are closed off at their outer ends, of course, by the juxtaposed inner faces of the adjacent portions of the ampule neck wall to form the blood telltale recess, with the remaining portions of the hub constituting blocking means partially filling the hollow outlet section or neck 43 to direct flow of blood against those portions of the latter serving as bore-closing windows.

With some liquid medicinal preparations adapted for subcutaneous administration, the blood masking effect is so pronounced that it may be desirable within the scope of the present invention to add to or use in lieu of the described windowed blood telltale pockets or recesses in the needle hubs other means to direct or divert blood flow on aspiration through another form of recess, such as a restricted channel located against the inner face of the window. For this purpose, as will be seen from Figs. 16 and 17, a dam, weir or transverse partition may be located in the blood telltale notch intermediate the points of communication of the latter with the bores of the cannula stub 51 and single-ended needle 153, to serve as a flow diverting baffle. This may be attained by providing a pair of longitudinally-spaced V-shaped notches 76, 76 in one side of the cylindrical hub 450 to define therebetween a flow-diverting weir 77 and with the notches respectively communicating with the cannula stub and needle bores. Flow across the crest of the weir immediately adjacent the inner face of the neck wall window portion 65 is assured by flatting or grinding off to form restricted passage 78 communicating the notches 76, 76 together. When such an embodiment is employed, suction created in the lower notch 76 which communicates with the bore of cannula stub 51 causes blood to be drawn through the bore of needle 153 into the outer notch 76 and then across the crest of weir 77 (or through restricted passage 78 formed thereby) for ready observation at that point. Notches 76, 76 and restricted passage 78 together form the blood telltale recess.

It will be understood that the restricted passage recess of an embodiment of the type shown in Figs. 16 and 17, or a plurality thereof, may be formed as one or more V-shaped notches in the crest of the weir 77 provided between the pair of longitudinally or axially spaced notches 76, 76. A plurality of such V-shaped notches 178—178 are illustrated in Fig. 18. As shown in Fig. 19, the restricted passage recess of a structure similar to that shown in Figs. 16 and 17 may be provided by a single V-shaped notch 278.

In the type of structures illustrated in Figs. 16 to 19 incl., flow of blood between the bore of the needle and the bore of the cannula stub is diverted by the baffle through one or more restricted recess passages located immediately adjacent the inner face of a window portion of the transparent ampule neck. As a consequence, masking tendency of the medicinal liquid is minimized, as has been proven by test. It will be seen that the observable

flow recess passage is defined by that portion of the crest of the weir which is disposed radially inward of the circular path of the generatrix of the cylindrical surface of the needle hub.

Advantageous features of structures of the type illustrated in Figs. 16 to 19 incl. may be attained by providing the cylindrical needle hub with a blood telltale recess in the form of a pair of longitudinally or axially spaced passages, respectively communicating with the needle and cannula bores, and a channel in the cylindrical surface of the hub connecting the axially-spaced passages together, as proposed in Figs. 20, 21 and 22. For such purpose, cylindrical hub **550** may be provided with a pair of axially-spaced, transversely-extending through holes or bores **79, 79**, with one communicating with the bore of needle **153** and the other communicating with the bore of cannula stub **51**. The two transverse holes **79, 79** are connected together by way of a channel **80** formed in the cylindrical surface of the hub **550**, and that channel may extend longitudinally from one of those holes to the other as shown, so that flow of blood therethrough will be immediately adjacent the inner face of the window portion **65** of the transparent neck wall.

As shown in Fig. 23, a needle and hub assembly of the type illustrated in Figs. 20 to 22, incl., may be modified in order to permit the blood flowing through the connecting channel to be viewed from all sides of the ampule neck. Such a structure may comprise a hub assembly **650**, including a bottom section similar to that proposed in Fig. 10, wherein the cannula hub **51** is made integral with circular plate **67**, and at the other end the single-ended needle **153** may be mounted upon a similar circular plate **167**, such as by being made integral therewith or secured thereto in a manner proposed in Figs. 11 and 12. An intermediate cylindrical section **81** is interposed between circular plates **67** and **167**, and is provided with a helical groove **82** extending 360° thereabout and from end to end so as to provide a restricted flow spiral passage immediately adjacent the inner face of the transparent ampule neck observable from any angle. The spiral passage formed by helical groove **82** communicates at each end with a diametrically-extending cross groove **83** formed across each end of the cylindrical section **81** so that one of those cross grooves communicates with the bore of cannula stub **51** and the other cross groove communicates with the bore of needle **153**. It will be understood that such cross grooves may be formed in the circular plates **67** and **167** rather than in the ends of the intervening cylindrical section **81**. However, it will be noted that the structure illustrated in Fig. 23 permits the circular plates **67** and **167** to be made in a simple manner from metal and confines all of the grooving to the mid-section **81**, which may be readily molded from suitable thermoplastic material. The cross grooves **83, 83** may be similar to that illustrated in Fig. 34.

A further variation of the embodiment shown in Figs. 20, 21 and 22 is illustrated in Figs. 24 and 25 which also permits observation of blood flow through restricted passages from all angles about the ampule neck. As there indicated, the hub **550** with its transverse holes **79, 79** may be provided with a pair of axially-spaced, circumferentially-extending or annular grooves **84, 84**, with one communicating with both ends of one of the transverse holes and the other arranged in like fashion with respect to the other of the transverse holes. Communication between the two circumferentially-arranged grooves **84, 84** is had by way of a plurality of passages arranged circumferentially about the mid-section of the hub **550**. Such communicating passage means may be provided by a plurality of circumferentially - spaced longitudinally - extending grooves similar to the communicating groove **80** of the Figs. 20, 21 and 22 embodiment, but preferably are provided conveniently by a plurality of flats **85—85** formed by grinding, as is best seen from Fig. 25.

Of course, when embodiments similar to those proposed in Figs. 9, 10 and 11, 14 and 15, and 20 to 25 incl. are employed, the portions of the neck wall juxtaposed to the end of any of the transverse holes or cross grooves effectively close them off except where they are communicated with others thereof by blood telltale recess passage grooves or flat-offs. Consequently, in all such embodiments, blood flow is confined intentionally to blood telltale recesses in the forms of defined, flow-diverting, tortuous paths, or to collecting in pockets or chambers, with suitable seals provided at opposite ends of the hub structure to prevent undesirable leakage and to confine the flow to the channels provided. Portions of the hub structures serve as blocking means partially filling the hollow outlet tubular sections or necks to direct or divert blood flow to adjacent the inner faces of those portions of the transparent outlet sections or necks serving as observation windows. It will be understood, also, that the restricted flow or tortuous channels which comprise the blood telltale means of the various embodiments previously described also form the outlets for expulsion of the ampule contents in subcutaneous admistration thereof. If all preceding embodiments, the hub structures each provide a blood telltale recess or pocket closed off by a window portion of the ampule, with the injecting needle bore connected to the ampule chamber via that recess or pocket. It will be seen that all of the embodiments of Figs. 16 and 17; Fig. 18; Fig. 19; Figs. 20, 21 and 22; Fig. 23; and Figs. 24 and 25 provide a needle hub structure carrying at opposite ends a cannula stub and an injecting needle, with the blood telltale recess provided in the side thereof being in the form of an elongated way formed in the side of a cylindrical body portion of the hub structure and having communication at opposite ends with the bores of the cannula stub and injecting needle. In the Figs. 16 and 17 embodiment, the elongated way comprises flat-off passage **78** communicating via notches **76, 76** with bores **62** and **63**. In the Fig. 18 structure the elongated way comprises any one of the notches **178**; and in the Fig. 19 construction it is the notch **278**. In the Figs. 20 to 21 incl. device, the elongated way comprises channel **80** communicating with the bores **62** and **63** by way of transverse ducts or holes **79, 79**; while in Fig. 23 it is the helical groove **82** with communicating end portions provided by cross grooves **83, 83**. In the Figs. 24 and 25 embodiment, the elongated way comprises any one of the longitudinally-extending flat-off passages **85—85** having communication at opposite ends with the cannula stub bore **62** and injecting needle bore **63** via transverse ducts or holes **79, 79** and the longitudinally-spaced, circumambiently-extending grooves **84, 84**.

In Fig. 26 is shown another embodiment of the hypodermic syringe of the present invention featuring a blood telltale thereof, and it will be recognized as an adaptation of such blood telltale to a well-known type of hypodermic syringe structure, such as the Cook type illustrated in Patent No. 1,661,818 of March 6, 1928. In that embodiment tubular barrel structure **86**, which may be formed as a cylinder of light-transmitting or transparent material, such as glass, is closed off at one end by a piston plug **87** and at the other end by another plug **88**, carrying therein a body **89** of injectable medicinal liquid, to form a loaded replaceable ampule. That loaded ampule is mounted in a suitable tubular syringe casing **90**, preferably cut away on opposite sides at **91, 91** to provide opposed elongated sight slots. The outer end of that loaded ampule is mounted in a socket **92** in head **93** with the bottom of the socket providing an abutment against which closing plug **88** may be rested. As is usual in such a type of syringe, head **93** has a seat or socket **94** therein which receives enlargement **95** mounted on a double-ended needle **96** intermediate its ends **97** and **98** respectively constituting the inner plug-piercing end and the injecting end. The outer end **99** of the tubular casing **90** carries finger-engaging wings, **100, 100**, and is internally-threaded at **101** threadably to receive a closure plug **102** having an axial bore **103** reciprocatively receiving plunger stem **104**. Plunger stem **104** carries on its outer end a thumb-engaging thrust knob **105** and preferably has its inner end detachably connectable to piston plug **87**, such as by means of an internally-threaded socket **106**, into which may be threadably engaged an externally-threaded stud **107** carried by the other end of piston plug **87** for temporary connection thereto to permit an aspirating action.

The blood telltale means of the hypodermic syringe device illustrated in Fig. 26 is incorporated in the ampule closing plug **88**. For this purpose, plug **88** may comprise a substantially cylindrical section **108** snugly receivable in the outer end of ampule tube **86** and having an end flange **109** to limit insertion, as is best illustrated in Fig. 27. Preferably such blood telltale plug **88** is in the form of a cork, as shown, and is formed of elastic material, such as by being molded from synthetic or natural rubber, for example, pure gum, with its cylindrical section **108** of slightly larger diameter than the internal diameter of tube **86**. Of course, section **108** may have usual alternating curved annular grooves and ridges if of such

dimensions, locations and shapes as not to interfere with the blood telltale elements described hereinafter.

Blood telltale plug or cork **88** is provided intermediate the ends of its cylindrical section **108** with a blood telltale recess in the form of a notch **110** formed in the side of that section extending through to and beyond the axis thereof. Notch **110** thus defines between it and outer end **111** on which flange **109** is formed, an intervening needle-pierceable cylindrical plug portion **112**, through which the inner needle end **97** is readily pierceable so that the needle bore is in communication with the recess notch as illustrated in Figs. 26 and 27. The recess notch **110** in turn is in communication with the ampule chamber or body **89** of liquid therein by way of a side channel **113** formed as a longitudinally-extending groove extending from the inner end **114** of the plug to that notch, as best seen from Figs. 27 and 28. Cylindrical section **108** of plug **88** defines the tubular structure **86** into two sections substantially at the plug inner end **114**. The tubular structure section between piston plug **87** and inner end **114** of plug **88** constitutes a syringe chamber and the remaining portion of the tubular structure between plug end **114** and the outer end against which plug flange **109** rests constitutes a hollow outlet section. The remaining structure of plug **88** forms blocking means partially filling that outlet section of the tubular structure to divert flow through recess notch **110** and recess channel **113** laterally to against the inner face of the transparent covering barrel wall. The latter is laterally offset from the bore of cannula or needle **96**, as is apparent from Figs. 26 and 27.

To prepare the hypodermic syringe device of Figs. 26, 27 and 28 for use, the operator selects a loaded ampule **86**, closed at opposite ends by piston plug **87** and blood telltale plug or cork **88**, between which is defined the syringe chamber section and in which is confined the body **89** of injectable medicinal liquid. The loaded ampule is loaded into the syringe casing **90** by unscrewing the rear head **102** and inserting the ampule with the outlet section in which is telescoped blood telltale plug leading. The ampule is then forced down by replacement of and threadably tightening the rear head **102** so that the head flange **109** of blood telltale plug **88** seats firmly against the inner face or rear surface **115** of the needle head **93**. Simultaneously the inner end **97** of the needle pierces through the outer portion **112** of the blood telltale plug **88** to communicate with the blood telltale recess notch **110**, as shown in Figs. 26 and 27. The plunger stem **104** is rotated threadably to engage the threaded stud **107** projecting from the outer end of the piston plug **87**. The device is then ready for use.

In operation of the hypodermic syringe device shown in Figs. 26, 27 and 28, the operator subcutaneously inserts the injecting end **98** of the needle **96**, and then with the use of novel features of the present invention, determines whether the needle bore is in communication with a vein. He applies slight pumping action to the piston plug **87** by means of the piston stem **104** to create sufficient suction to draw blood up through the needle bore to its inner end **97** if inserted in a vein. Collection of blood and swirling thereof may then be observed in the recess notch **110** through the transparent wall of the cylindrical ampule barrel. In the event that the medicinal contents to be injected is of a milky or highly masking character, a showing of blood may be readily observed in the blood telltale recess groove **113** communicating the ampule chamber with the notch **110**, since that restricted channel is located immediately adjacent and, in fact, is closed off by the inner face of the ampule wall, causing the aspirated blood tortuously to flow against that wall in passing through the passage where it will be readily observed. Obviously, more than one such blood telltale recess groove **113** may be employed suitably distributed about the shank **108** of the blood telltale plug **88** through at least one half the circumference thereof so that aspirated blood may be observed from a number of positions. The blood telltale plug **88** is a simple adaptation of the blood telltale means of the present invention to the well-known type of hypodermic syringe illustrated in Fig. 26.

As proposed in Figs. 29 and 30, the blood telltale elastic plug or cork may take the form of that indicated at **188** wherein the blood telltale recess is provided by a cross bore **116** in substitution for the transverse notch **110**, and with longitudinal channel groove **113** communicating between the inner plug end **114** and that recess cross bore, as there shown. In order to provide for blood showing channels circumferentially about the shank **108**, the latter may be provided with an annular groove **117** in communication with the ends of the cross bore **116** and from which a plurality of longitudinally-extending blood showing channels **113** may extend to the inner end **114** of the plug shank, the cross bore, annular groove and channel or channels collectively forming the blood telltale recess. In the hypodermic syringe device of the type illustrated in Fig. 26, when a blood telltale plug of the type shown in Figs. 29 and 30 at **188** is employed, one or more of the longitudinally-extending channels **113** will always be observable so that blood tortuously aspirated therethrough may be readily seen. Of course, the one or more longitudinal channels **113** also constitute the expelling outlet for the hypodermic syringe so that the body **89** of medicinal liquid may be expelled from the ampule for subcutaneous administration after the intended use of the blood telltale feature.

As shown in Figs. 31 and 32, the blood telltale recess cross bore in the blood telltale plug or cork may be so arranged that a portion of its mouth at one end also serves as the blood flow channel. Thus, elastic ampule-closing blood telltale plug **288** may have an obliquely-arranged cross bore **216** so that its mouth opens both through the side wall of the shank **108** and its inner end **114** at the junction thereof to form the channel notch **119**, with the oblique bore and its mouth notch together forming the blood telltale recess. The blood is aspirated tortuously into the ampule chamber through notch channel **119** from the cross bore **216** after being drawn thereinto through the bore of the needle **96**, to be readily observable at the notch regardless of the opacity or blood masking characteristics of the medicinal liquid in the ampule.

In Figs. 33 and 34 are shown a modified blood telltale cork construction comprising a simple adaptation of the blood telltale means to plug structure similar to that now well known in the trade. In that embodiment, the elastic ampule-closing plug **388** has the end **114** of its shank portion **108** provided with an axial recess **120** into which the inner end **97** of needle **96** is thrust. The blood telltale means comprises a separate cylindrical section **121** adapted to have its inner face **122** seated against the inner end **114** of the plug **388**. In the inner face **122** of section **121** a cross groove **123** is formed so as to be in communication with recess **120**. One end of the cross groove **123** communicates with longitudinal blood flow channel recess **113** which extends to the outer face **124** of the section **121**. Obviously, the opposite end of cross groove **123** may also communicate with another longitudinal blood flow channel recess **113**, so that flowing blood will be observable from opposite sides of the ampule.

Further, there may be substituted for the cross groove **123** and axially-extending annular land on the face **122** to seat against the outer edge of the inner end **114** of plug shank **108**, and with the circular recess formed inside such land communicating with a plurality of circumferentially-spaced, longitudinally-extending blood flow recess channel grooves **113** distributed about section **121**. Such blood telltale recess grooves, of course, may extend through such circular land. Such a structure is illustrated in Fig. 35 wherein section **221**, similar to section **121** of Figs. 33 and 34, is shown provided with a circular interrupted land **222** circumscribed about a central recess **223** to be in communication with recess **120** in plug shank **108**, and in turn in communication with the ends of the plurality of longitudinally-extending blood flow recess grooves **113** through interrupting notches in the land **222**.

It will thus be seen that a common type of ampule closing plug having the usual axial recess in the inner end of the shank thereof to which the inner end of a double-ended hypodermic needle is to be thrust, may be readily converted to blood telltale means or cork construction of the present invention by associating therewith an additional section, such as **121** of Fig. 34, and **221** of Fig. 35. There is no need for physically connecting or securing such additional section to the end of the ampule closing plug since frictional contact with the inner surface of the side wall of the ampule will maintain it in its relative position adjacent the inner end **114** of the closing plug **388** and, during aspiration at the

relatively low pressures developed, there will be little if any tendency to displace it. As in the other embodiments shown in Figs. 27 to 32 incl., the ampule contents is expelled when the piston plug 87 is thrust forward in the ampule tube 86 by means of the plunger stem 104 through the one or more longitudinally-extending flow passages 113 into the recess 120 and then via the bore of needle 96.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description are efficiently attained and, since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In hypodermic syringe structure, the combination comprising, means providing a liquid chamber having a movable portion to vary the volume thereof, means providing a hollow outlet section for said chamber and including a light-transmitting wall portion, an injecting cannula having a bore, means to support said injecting cannula with the interior of its bore in communication with said outlet section outward of said light-transmitting wall portion and in turn through said section into communication with said chamber, and blocking means in said section partially filling the interior thereof to direct flow in said section to adjacent said light-transmitting wall portions for ready color identification through the latter.

2. The structure as defined in claim 1 characterized by said movable chamber portion being reciprocative for aspirating the hypodermic syringe, said blocking means being formed to divert flow of blood from said cannula bore toward said chamber along the inner face of said light-transmitting wall portion.

3. A hypodermic syringe including blood telltale means comprising a tubular structure having a section serving as an aspirating syringe chamber and a second outlet section provided with a transparent wall portion, plug means in said second section having side recess means disposed against said transparent wall portion and communicable with said chamber, a syringe needle having a bore, and means communicating the bore of said syringe needle with said recess means to feed blood thereto upon syringe aspiration for ready observation through said transparent wall portion.

4. The blood telltale structure as defined in claim 3 characterized by said recess means providing a channel closed on one side by said transparent wall portion.

5. The blood telltale structure as defined in claim 3 characterized by said recess means providing a pocket in communication with the needle bore and closed on one side by said transparent wall portion, and means to connect said pocket to said chamber.

6. The blood telltale structure as defined in claim 5 characterized by said recess means providing with its pocket portion a channel closed on one side by said transparent wall portion and forming a portion of the connecting means communicating said pocket with said syringe chamber.

7. The blood telltale structure as defined in claim 3 characterized by said tubular means being in the form of a transparent tubular neck slidably receiving said plug means separated from said chamber by a needle-pierceable diaphragm, said plug means carrying a diaphragm-piercing cannula stub on one end and the syringe needle on the other end with the bores of both in communication through said recess means.

8. The blood telltale structure as defined in claim 7 characterized by said recess means as comprising a pocket, and the provision of flow diverting means in said pocket located between points of communication of said bores with said pocket causing flow through the latter to travel against a portion of the inner face of said transparent neck.

9. The blood telltale structure as defined in claim 8 characterized by the formation of said pocket as a notch in one side of said plug means, and said flow diverting means as weir means in said notch between said bores with its crest disposed near said transparent neck inner face.

10. In a hypodermic syringe structure the combination with an aspiratory ampule having a tubular transparent end, and an injecting needle having a bore connectable to said ampule end, of plug means closing off said end having a recess in a side thereof facing a portion of the wall of said transparent end, said recess being communicable between the bore of the injecting needle and the interior of said ampule so that blood aspirated through said bore will show in said recess.

11. The structure as defined in claim 10 characterized by the provision of said recess in said plug means as a notch in one side of said plug means communicable with the needle bore and a channel in the side of said plug means leading from said notch to the inner end of said plug means, with said notch and channel closable along the side by the transparent wall portion.

12. The syringe structure as defined in claim 10 characterized by said blood telltale plug means for closing the transparent end of said aspiratory hypodermic syringe ampule as comprising a substantially cylindrical body means of needle-pierceable elastic material having inner and outer ends and a chamber intermediate its ends with a portion between the outer end and the chamber being readily pierceable by the inner end of said hypodermic needle with the latter being of the double-ended type to bring the bore of the latter into communication with said chamber, the side of said body means between its inner end and said chamber being provided with a flow channel closable along the side by the inner face of the end of the ampule; so that blood aspirated through the needle bore, chamber and channel may be observed in the latter through the overlying portion of the ampule.

13. The syringe structure as defined in claim 10 characterized by said blood telltale plug means for closing the transparent end of said aspirating hypodermic syringe ampule as comprising a substantially cylindrical elastic element having an inner end insertable in said ampule end to close it off and having an enlargement on its outer end to limit such insertion, said substantially cylindrical element having a groove in its side wall extending from its inner end to a point short of its outer end, and means providing a passage from said groove to the interior of said element terminating short of its outer end to define a readily needle-pierceable portion between said outer end and passage so that said needle may be pierced through said portion to communicate the bore of said needle with said passage, said groove constituting a telltale channel when closed off on the side by a portion of the wall of the ampule.

14. The syringe structure as defined in claim 10 characterized by said blood telltale plug means for closing the transparent end of said aspiratory hypodermic syringe ampule comprising a rubber cork having an enlarged head and a substantially cylindrical shank with the latter insertable in said end of the ampule, said shank having an inner end and a recess along one side extending from its inner end toward said enlarged head, and means communicating said recess with the interior of said cork near said head at an axial point appreciably short of said inner end and to which said needle may be pierced substantially axially through said head.

15. The blood telltale cork as defined in claim 14 characterized by said communicating means being in the form of a notch in a side of said shank and said recess being in the form of a groove extending longitudinally from said notch to the inner end of said shank.

16. In a hypodermic syringe structure blood telltale means comprising, in combination, a substantially cylindrical plug receivable in a transparent tubular end of an aspirating ampule, and a hollow hypodermic syringe needle supported on one end of said plug, said plug having a recess in a side thereof intermediate its ends in communication with the bore of said needle and having an open side closable by a portion of the wall of the tubular end of said ampule when the plug is inserted therein and a passage extending from said recess through the inner end of said plug for communication with the interior of the ampule.

17. The blood telltale means as defined in claim 16 characterized by the provision of said recess in said plug in the form of a notch in the side of said plug ex-

tending substantially to the axis thereof, said notch having a transverse baffle element therein intermediate its ends and extending laterally with its crest in at least one portion being disposed radially inward of the circular path of the generatrix of the cylindrical surface of said plug to provide thereat an external flow passage adjacent the inner surface of the tubular end of the ampule when said plug is inserted therein.

18. The blood telltale means as defined in claim 17 characterized by the provision of said transverse baffle element as an integral part of said plug formed by providing a pair of axially-spaced, transversely-extending V-shaped notches in the side of said plug with one communicating with the bore of said needle and the other communicating with the passage leading to the inner end, said baffle element having its curved crest cut away at at least one point to provide the telltale flow passage.

19. The blood telltale means as defined in claim 18 characterized by the provision of a diaphragm-piercing cannula stub extending axially inward of the inner end of said plug and having a bore extending to the nearest notch so that when said plug is slidably mounted in an elongated transparent cylindrical neck of an ampule closed off at the bottom of the neck by a needle-pierceable diaphragm, the interior of the ampule may be brought to communication with the notches by way of the bore of the cannula stub when the latter is pierced through the diaphragm.

20. A single dosage hypodermic syringe comprising, in combination; an aspirating ampule comprising a collapsible tubular portion of elastic material terminating in a transparent hollow neck extending from one end thereof with its bore sealed off at the bottom by a needle-pierceable membrane; a substantially cylindrical body slidably received in the neck bore and temporarily held in an outward ready position; and double-ended cannula means mounted on said body with an outer injecting needle end having a bore and extending substantially axially from the outer end of said body, and an inner diaphragm-piercing stub end having a bore and extending substantially axially inward from the inner end of said body and spaced outwardly from said membrane when said body is in its outward position, said body having in a side thereof intermediate its ends a recess closed off on the laterally outer side by the inner face of said neck and communicating at axially-spaced points with the bores of said needle and said cannula stub to provide the sole communication therebetween, said recess providing a blood telltale when said needle is intravenously positioned and said collapsible tubular portion is aspirated.

21. The hypodermic syringe structure as defined in claim 20 characterized by the provision of the blood telltale recess as an elongated way in the side of said cylindrical body communicating at opposite ends with the bores of the cannula stub and the injecting needle.

22. The hypodermic syringe structure as defined in claim 20 characterized by the provision of said recess as a pair of axially-spaced V-shaped notches defining therebetween a transversely-extending baffle portion having its crest flatted off to form a flow passage adjacent the inner face of said neck with the notches respectively communicating separately with the bores of said cannula stub and said injecting needle.

23. The hypodermic syringe structure as defined in claim 20 characterized by said body being formed in three transverse sections with one cylindrical section carrying the injecting needle and having the bore of the latter extending through to the inner face thereof, a similar second cylindrical section carrying said cannula stub and having its bore extending through to the inner face thereof, and an intermediate substantially cylindrical section having a spiral groove in the cylindrical surface thereof extending at least 360° thereabout and from end to end, said intermediate section being adapted to have its ends respectively abutted against the inner ends of the other two end sections and with one of said end sections and the intermediate section providing a pair of juxtaposed sections at each end of the cylindrical body structure, one section of each of the two pairs thereof at opposite ends of said body structure being provided with a passage extending outwardly from the bore to communicate with said spiral groove so that the latter provides communication between the bores and serves as a blood telltale passage.

24. The hypodermic syringe structure as defined in claim 20 characterized by termination of the bores at axially-spaced points communicating thereat with longitudinally-spaced, transversely-extending ducts communicating with each other by way of at least one longitudinally-extending channel in the outer surface of said body to provide a blood telltale passage, said ducts and channel together comprising said recess.

25. The hypodermic syringe structure as defined in claim 24 characterized by said transverse ducts opening outwardly into a pair of longitudinally-spaced circumambiently-extending grooves in the outer face of said body with the portion of the latter intervening, said circumambient grooves being provided with longitudinally-extending ways in the circumferential surface thereof extending from one groove to the other at circumferentially-spaced points thereabout to be closed off on their outer sides by the inner face of said neck to form a plurality of longitudinally-extending blood telltale passages with at least one observable from any side of said neck.

26. In hypodermic syringe structure, the combination comprising, means providing a liquid chamber having a movable portion to vary the volume thereof, means providing an outlet passage for said chamber, an injecting cannula having a bore, means to support said injecting cannula with its bore in communication with said outlet passage, light-transmitting wall means defining a portion of said outlet passage between said cannula bore and said chamber, and means to guide liquid in said passage in a non-linear path having a portion adjacent said light-transmitting wall means to enable ready color identification through the latter.

27. In hypodermic syringe structure, the combination comprising, means providing a liquid chamber having a movable portion to vary the volume thereof, means providing an outlet passage for said chamber, an injecting cannula having a bore, means to support said injecting cannula with its bore in communication with said outlet passage, light-transmitting wall means laterally offset from said bore defining a portion of said outlet passage between said bore and said chamber, and means to guide liquid in said passage in a path laterally of a straight line path between said bore and chamber to adjacent said light-transmitting wall means to enable ready color identification through the latter.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,687,502	Marcy	Oct. 16, 1928
2,551,414	Burnside	May 1, 1951

FOREIGN PATENTS

Number	Country	Date
573,611	Great Britain	Nov. 28, 1945