

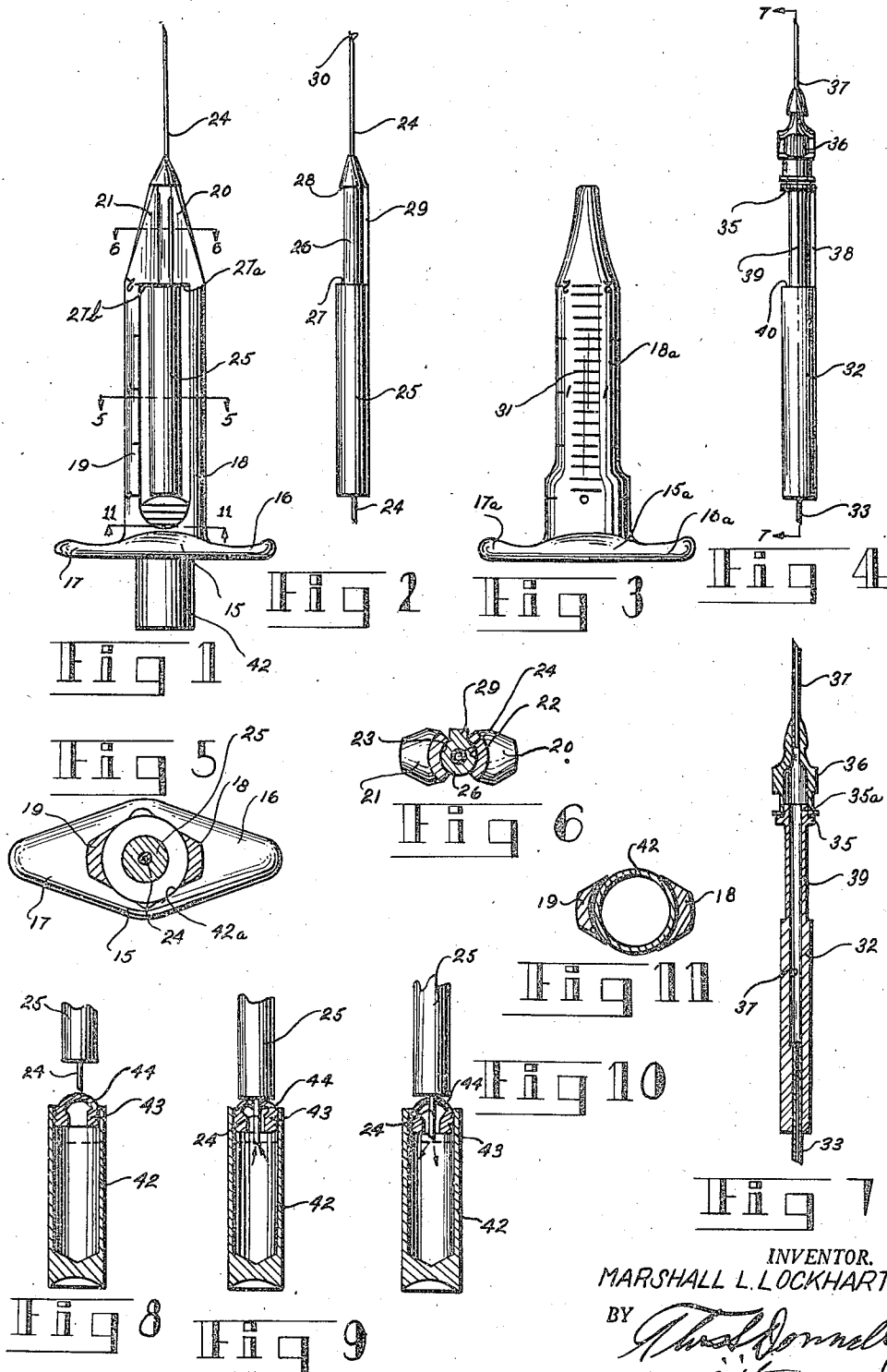
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HYPODERMIC SYRINGE

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HYPODERMIC SYRINGE

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My invention relates to a new and useful improvement in a hypodermic syringe. Such syringes generally comprise a barrel which forms a cylinder and in which the serum is deposited. Slidable in the barrel or cylinder is a piston used for ejecting the serum which passes outwardly through a hollow needle. This serum is generally obtained in an ampule and transferred from the ampule to the ejecting cylinder.

It is a purpose of the present invention to provide a hypodermic syringe so constructed and arranged that the ampule itself will operate as the cylinder and the closure, which serves to close the end of the ampule, will operate as the piston.

In making an injection, the proper procedure requires that the operator ascertain whether or not he has entered a vein or whether the needle is otherwise in a proper position for injecting. This is usually accomplished by withdrawing the piston slightly after the needle has been inserted until a showing of blood appears in the cylinder, which is transparent. With this in mind, it is an object of the present invention to provide an ampule having a closure so constructed and arranged that a release of pressure on the ampule will permit it to be forced rearwardly relatively to the piston forming closure sufficient to permit the necessary showing of blood.

Another object of the invention is the provision of a syringe so constructed and arranged that the sterilizing may be limited to the needle and the needle support.

Still another object is that of providing in a hypodermic syringe a needle support having a hollow needle projected therethrough.

A further object is that of furnishing a holding member which will serve to detachably hold and grip a needle support so that the needle support and needle may be easily removed for sterilizing.

The injecting needle on hypodermic syringes is generally cut on a bevel at the penetrating end and the proper technique of insertion requires that the diagonal side of the needle be positioned in a certain position relatively to the skin before puncturing. It is a still further object of this invention to furnish a needle and a needle support having means for indicating the proper side of the needle to be faced toward the skin while inserting.

An additional object is the provision of a needle having a needle support formed thereon provided with a presser portion.

Still another object of this invention is that

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of providing in a hypodermic syringe a holding or retaining member for holding the needle in operative position, so constructed and arranged that when tilted to lie on its side the needle support will retain the needle out of contact with a surface, such as a table top on which it may be positioned.

Another object of the invention is the provision of an ampule having a bulb forming closure mounted therein and serving as a closure therefor.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating practical embodiments of the invention, and in which:

Fig. 1 is a side elevation of a hypodermic assembly;

Fig. 2 is a similar view of the needle and its associated parts;

Fig. 3 is an elevation of an alternative form of retainer;

Fig. 4 illustrates an alternative form of the needle assembly;

Figs. 5 and 6 are cross-sectional views taken along the lines 5—5 and 6—6 respectively and in the direction of the arrows as indicated in Fig. 1;

Fig. 7 is a sectional side view taken along the lines 7—7 and in the direction of the arrows as indicated in Fig. 4;

Fig. 8 is a sectional side view of an ampule showing a fragment of the syringe or retainer assembly disposed adjacent thereto;

Fig. 9 is a similar view showing such assembly in operative association with the ampule;

Fig. 10 is a view similar to Fig. 9 but illustrating the position which the parts assume when an aspirating action is being undertaken; and

Fig. 11 is a transverse sectional view taken along the lines 11—11 and in the direction of the arrows as indicated in Fig. 1.

In the drawing I have illustrated a retainer embodying a base 15, having wings 16 and 17 projecting laterally outwardly therefrom at opposite sides thereof to serve as finger grips; a pair of spaced apart legs 18 and 19 projecting outwardly in parallel spaced relation from one face of the base 15, these parts being preferably formed with the base 15 and fabricated from a suitable material having sufficient spring for the purposes intended. The ends of the legs 18 and 19 are tapered to narrower cross-section, as shown in Fig. 6, to constitute the gripping portions 20 and 21, having the concaved exposed faces 22 and 23.

A hollow elongated needle 24 is used, having

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the piercing end cut on a bevel, as shown at 30. This needle is carried by a suitable supporting member formed from any suitable material, and preferably a plastic, which is molded around the needle 24 in fixed relation thereto. It will be noted that the needle 24 projects beyond opposite ends of the supporting member. This supporting member is reduced in cross-sectional area, as at 26, to provide the shoulders 27 and 28. To mount the supporting member between the legs of the retainer, the legs 18 and 19 are sprung apart sufficiently to allow the portion 26 of the supporting member to be engaged between the portions 20 and 21, the shoulder 27 engaging the shoulders 27a and 27b and the shoulder 28 engaging the end faces of the portions 20 and 21. After the portion 26 has been shoved into position between the portions 20 and 21, these parts 20 and 21 snap into gripping relation with the portion 26 and serve to retain the supporting member in position on the retainer. A rib 29 projects outwardly from one side of the portion 26 so as to indicate to the operator the beveled side 30 of the needle 24.

When the supporting member is mounted in the position shown in Fig. 1, an ampule 42 is used as a cylinder. As shown in Fig. 8, this ampule 42 is of considerably larger diameter than the thrust portion 25 of the needle support. This ampule contains the serum to be injected and is closed at its open end with a closure 43 having a flexible portion 44. The ampule is inserted through the opening 42a formed in the base 15, this opening being of sufficient size to constitute a guide for the ampule 42 as it is slid. As shown in Fig. 11, the legs 18 and 19 are formed concave on their inner face to serve also as guides for the ampule 42. As the ampule is slid into position, it will approach the rear end of the needle 24, as shown in Fig. 8, and a further sliding will cause this portion of the needle to pierce the closure 43 and flex it, as shown in Fig. 9. When in this position, the ampule may be pressed downwardly by the operator's thumb and the thrust portion 25 of the needle support will serve to force the closure of the ampule inwardly and the ampule to operate as a piston and force the liquid outwardly through the needle. After the ampule and the needle and the thrust portion 25 have been brought into the relative position shown in Fig. 9, the operator may release the pressure of the thumb on the end of the ampule, permitting the ampule to move into the position relative to the thrust portion 25 shown in Fig. 10. Upon release of this pressure, the flexible closure will flex back to its normal position causing blood to be drawn into the ampule so that the operator may have the necessary evidence of proper insertion of the needle. In this manner, a desirable aspirating action is provided for. It will be noted that the thrust portion 25 merely serves as a needle retainer and as a means for thrusting the cork or closure of the ampule inwardly of the ampule.

It is believed obvious that when it is desired to sterilize the instrument needle, all that is necessary to be sterilized are the parts shown in Fig. 2. The operator, in performing the injections may, by having a supply of needle supports with the needles attached thereto, continue to operate while the surplus supply is being sterilized.

The form of unit shown in Fig. 3 is the same, substantially, as that shown in Fig. 1 excepting that the wings or finger grips 16a and 17a project outwardly from the base 15a at right angles

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to the direction of projection of the finger grips 16 and 17 from the base 15. Also, the legs 18a are provided with graduations 31 so that the operator by forcing the ampule inwardly can ascertain how much of the serum has been injected.

In this form should the retainer be laid on its side, the finger grips 16a and 17a, which project outwardly from the base 15a, would prevent tilting in one direction and the legs 18a lying on a table top would serve to retain the needle in elevated relation to the table top so that contamination of the needle would be prevented.

In Fig. 7 I have shown a slight modification in which I use a needle support embodying a thrust portion 32 having a bore 37 formed therethrough and communicating with the needle section 33 which extends beyond the butt end of the thrust portion 32. This needle support also comprises a constricted portion 39 projecting outwardly at the end of which is a flange 35. A needle retainer 36 is fitted over the end 35a; this needle retainer 36 serving to retain the needle 37. This is merely an illustration of how a separable needle may be used on the needle support and retainer, although I prefer the construction shown in Fig. 1 and Fig. 2.

In the form shown in Fig. 4 and Fig. 7, the guide rib 38 to indicate the diagonal cut of the needle is also present. Using a hypodermic syringe constructed in this manner, the various advantages referred to are obtained and there is thus provided a hypodermic syringe possessing a high degree of efficiency.

Thus, among others, the several objects of the invention as specifically afore noted are achieved. Obviously, numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

What I claim as new is:

1. A hypodermic syringe including a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, said portions providing between them a needle-gripping structure such that, by flexing said legs to separate the gripping portions, a needle may be moved laterally into position therebetween, and said base being formed with an opening in line with the space defined between said legs whereby an ampule may be projected therethrough into such chamber.

2. A hypodermic syringe including a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, said portions providing between them a needle-gripping structure such that, by flexing said legs to separate the gripping portions, a needle may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs whereby an ampule may be projected there-

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through into such chamber, and the inner faces of said portions being curved to provide surfaces substantially conforming to the curved surfaces of a needle assembly to be received between said gripping portions.

3. A hypodermic syringe including in combination a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, a needle assembly, said portions providing between them an assembly-gripping structure such that, by flexing said legs to separate the gripping portions, the assembly may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs whereby an ampule may be projected therethrough into such chamber, and means forming a part of said as-

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sembly and cooperable with portions of said body to prevent axial movement of said assembly after it is gripped by said portions.

4. A hypodermic syringe including a body comprising a base, a pair of legs fixedly connected adjacent their inner ends to said base, said legs extending from said base in spaced relationship to define an ampule-receiving chamber between them and having free outer ends, said body being formed of material such that the outer ends yieldingly resist separation, needle-gripping portions adjacent the outer ends of said legs and disposed beyond the end of said chamber, said portions providing between them a needle-gripping structure such that, by flexing said legs to separate the gripping portions, a needle may be moved laterally into position therebetween, said base being formed with an opening in line with the space defined between said legs, and means forming a part of said syringe and providing a thrust portion to engage with the piston-closure of an ampule projected through said base opening and into the chamber between said legs.

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