

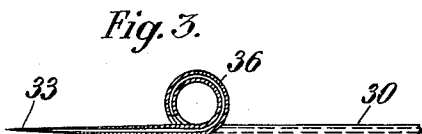
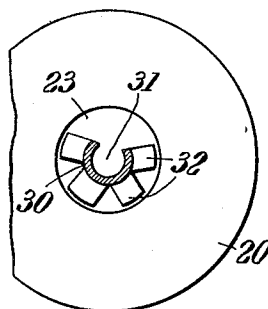
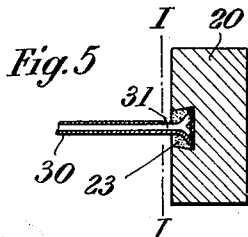
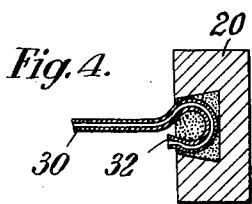
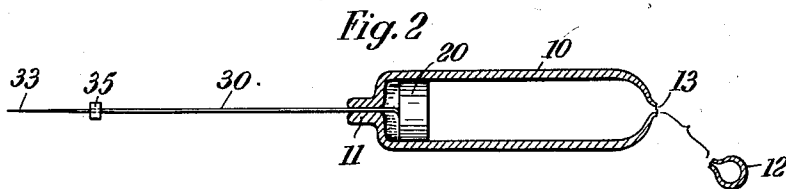
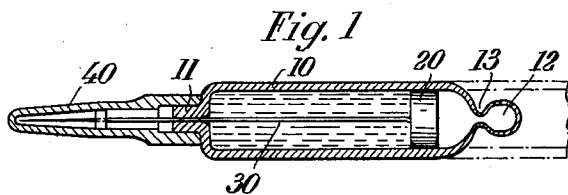
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C. BAUDOUIN ET AL

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AMPULLA SYRINGE

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Inventors:
Charles Baudouin
Karl Pietsch
by Karl Viertel
Attorney.

UNITED STATES PATENT OFFICE

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AMPULLA SYRINGE

Charles Baudouin and Karl Pietsch,
Hersfeld, Germany

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5 Claims. (Cl. 128—220)

Our invention relates to hypodermic syringes and more especially to structural improvements in hypodermic syringes of the ampulla type, in which the medicinal liquor to be injected is permanently enclosed and stored for instantaneous administration.

Ampulla-syringes because of being ready for instantaneous use and because of taking up relatively little room and being of relatively light weight are particularly useful in such cases of emergency, where a great number of patients must be treated simultaneously or in speedy succession as after railroad accidents, earth quakes, in times of war, in remote districts far from hospitals, where epidemic diseases are rapidly spreading, and in other places, where ordinary syringes cannot be timely and properly sterilized for want of sterilizing apparatus, sterilizing substances, trained helpers, accommodation, etc.

However some difficulties and drawbacks specific of syringes commonly used are also inherent to ampulla-syringes of known design, which are due to the fact, that the plunger of the syringe—on injecting the liquid—must be forcibly pushed forward by means of a handle in the direction of the needle of the syringe, viz towards the body of the patient, and that considerable care and skill are required in so manipulating the syringe and controlling the depth of the needle where the injection is to occur, that an accidental axial displacement of the needle and a complete (double) piercing of the vena into which the medicinal liquor is to be injected, are avoided.

The primary object of our invention is to overcome the difficulties indicated by providing a structurally improved ampulla syringe which can be safely handled even by persons who have very little medical training, and in which the risk of wrongly administering the medicinal liquor by completely (doubly) piercing accidentally the patients vena is greatly reduced.

The invention further aims at providing an improved hypodermic ampulla-syringe of relatively simple design which can be manufactured and supplied in quantities at a comparatively low price so that it does not matter to throw it away after use, and that the total costs involved by the treatment of a great number of patients do not or not appreciably exceed the costs of using liquor containing ampulla and syringes of known design and of sterilizing the latter.

Other objects of the invention will become incidentally apparent hereinafter.

The nature and scope of the invention are

briefly outlined in the appended claims and will be more fully understood by the following specification taken together with the accompanying drawing in which

Figs. 1 and 2 are cross sections through a hypodermic injecting device designed according to this invention and being shown by way of an example before use and after use,

Fig. 3 is a fragmentary view of a structurally modified hypodermic needle, shown in a larger scale,

Figs. 4, 5 are fragmentary cross sections made in a larger scale and showing by way of examples the attachment of the needle to the plunger,

Fig. 5a is a front elevation partly in section, taken along line I—I of Fig. 5 and showing the inner end of the needle in a larger scale.

An ampulla-syringe, structurally improved according to this invention, consists of a cylindrical barrel 10, which is closed at its front end facing the patient by a wall having a projecting portion 11, and is sealed at its rear end by removable sealing means, viz a bulb 12 having a hollow neck 13, of a plunger 20, slidably fitted in said barrel in such position as to enclose a column of medicinal liquid in the front end of the barrel, and of a tubular hypodermic needle 30, substantially longer than said barrel, being secured to the plunger 20 for actuating the latter and being slidably fitted in the front wall of the barrel.

The total length of the hypodermic needle 30 is so chosen as to present to the operator a retaining member on being pushed into the body of the patient, while the barrel, presenting a complementary counter-handle is rearwardly withdrawn relatively to the plunger from the patient. The medicinal liquor, indicated by dash-lines is enclosed in the space in front of the plunger and is free to enter into the hollow needle at its inner end through a hole 31, 32 shown in Figs. 4, 5, 5a respectively.

The manipulation of the ampulla syringe described is as follows: The discharge end 33 of the needle acting as a plunger rod is inserted into the body of the patient and is held in place therein by the attendant administering the injection.

There upon by pulling back with the other hand the barrel 10 viz away from the body of the patient the medicinal liquor is discharged through the discharge end of the needle at 33.

In order to facilitate and render safer the manipulation of the injecting device I prefer to provide the needle 30 with a small handle such

as a knob 35 (Figs. 1-2) rigidly secured to the front portion of the needle at a suitable distance from the discharge point of the latter.

For securely protecting the needle 30, while at rest, against infective contact and damage the needle should be enclosed in a detachable hood which can be quickly removed. In the embodiment of the invention shown in Figs. 1 and 2 the said hood 40 is secured by frictional contact to the bottom portion 11 of the barrel.

An important point is the safe attachment of the needle 30, i. e. plunger rod, to the plunger 20. In Figs. 5 and 5a the tubular needle is shown to have been split at its extreme end into a number of tabs 32' from which one is broken off so as to form an intake hole at 31.

The remaining tabs 32' are bent around and secured in a preferably dove-tail shaped recess 23 of the plunger by means of a plastic compound adapted to rigidify.

Various changes and modifications may be made in the structural details of hypodermic injecting devices of the improved design described above, without departing from the spirit and the salient ideas of this invention.

Fig. 4 shows another convenient way of attaching the tubular needle 30 to the plunger 20 viz by forming a resilient loop 36, forcing the latter into a dove-tail shaped recess of the plunger and fixing it therein with or without the application of a plastic compound.

Instead of providing a knob 35 as a handle at the needle 30, the latter may be formed with a loop 36 as shown in an enlarged scale in Fig. 3. A convenient method of making barrels for the purpose described of an easily fusible material, e. g. glass, is indicated in dotted lines in Fig. 1, showing the original form of the barrel, before the latter is closed by fusion under the action of heat.

It should be noted that injecting devices of the design described can be conveniently used in empty state, i. e. after the discharge of the medicinal liquor, for withdrawing blood, mucus, pus etc. from the body of the patient. In such cases the needle is inserted and held in place by its handle, whereafter the barrel is pushed toward the patient.

What we claim is:

1. In an ampulla-syringe, wherein medicinal liquor is permanently stored, a cylindrical barrel closed at its front end by a wall and at its rear end by removable sealing means, a plunger, slidably fitted in said barrel and enclosing medicinal liquor contained in the front end of the barrel, a tubular hypodermic needle, secured to said plunger for actuating the latter and being slidably fitted in the front wall of the barrel, an aperture in said needle allowing the said liquor to enter the latter, the said needle being adapted as to its length to be grasped by the operator and to serve on injecting the liquid as a gauging and retaining member, while the barrel is rearwardly withdrawn relatively to the plunger and the patient, and retaining means the latter comprising a loop formed in the front section of the needle.

2. In an ampulla-syringe, wherein medicinal liquor is permanently stored, a cylindrical barrel closed at its front end by a wall and at its rear end by removable sealing means a plunger, slidably fitted in said barrel and enclosing medicinal liquor contained in the front end of the barrel,

and a tubular hypodermic needle, secured to said plunger for actuating the latter and being slidably fitted in the front wall of the barrel, an aperture in said needle allowing the said liquor to enter the latter, the said needle being adapted as to its length to be grasped by the operator and to serve on injecting the liquid as a gauging and retaining member, while the barrel is rearwardly withdrawn relatively to the plunger and the patient—the inner end of the needle being split into several bent over tabs leaving free an intake hole and being fixed in a recess of the plunger.

3. In an ampulla-syringe, wherein medicinal liquor is permanently stored, a cylindrical barrel closed at its front end by a wall and at its rear end by removable sealing means a plunger, slidably fitted in said barrel and enclosing medicinal liquor contained in the front end of the barrel, and a tubular hypodermic needle, secured to said plunger for actuating the latter and being slidably fitted in the front wall of the barrel, an aperture in said needle allowing the said liquor to enter the latter, the said needle being adapted as to its length to be grasped by the operator and to serve on injecting the liquid as a gauging and retaining member, while the barrel is rearwardly withdrawn relatively to the plunger and the patient,—the inner end of the needle being formed with a loop, which is fixed in a recess of the plunger.

4. In an ampulla-syringe, wherein medicinal liquor is permanently stored, a cylindrical barrel closed at its front end by a wall member and its rear end by a frangible tip portion adapted to be broken before use, a plunger, slidably fitted in said barrel and adapted to enclose medicinal liquor between the front end of the barrel and the front end of the plunger, a tubular hypodermic needle substantially longer than said barrel, secured to said plunger and forming an operating means therefor, said needle being slidably fitted in an opening in the front wall of the barrel, and an aperture in said needle communicating with the space in the front end of the barrel and allowing said liquor to enter the needle, the said needle being adapted as to its length to be grasped by the operator and to serve on injecting the liquid as a retaining member, said barrel being adapted to be rearwardly withdrawn relatively to the plunger and the patient.

5. In an ampulla-syringe, wherein medicinal liquor is permanently stored, a cylindrical barrel closed at its front end by a wall and at its rear end by removable sealing means, a plunger slidably fitted in said barrel and enclosing medicinal liquor contained in the front end of the barrel, a tubular hypodermic needle secured to said plunger for actuating the latter and being slidably fitted in the front wall of the barrel, an aperture in said needle allowing the said liquor to enter the latter, the said needle being adapted as to its length to be grasped by the operator and to serve on injecting the liquid as a retaining member, while the barrel is rearwardly withdrawn relatively to the plunger and the patient, and holding means mounted on said needle exteriorly of said barrel, adapted to be grasped by the operator for holding said needle in place against a patient's body during use.

CHARLES BAUDOUIN.
KARL PIETSCH.