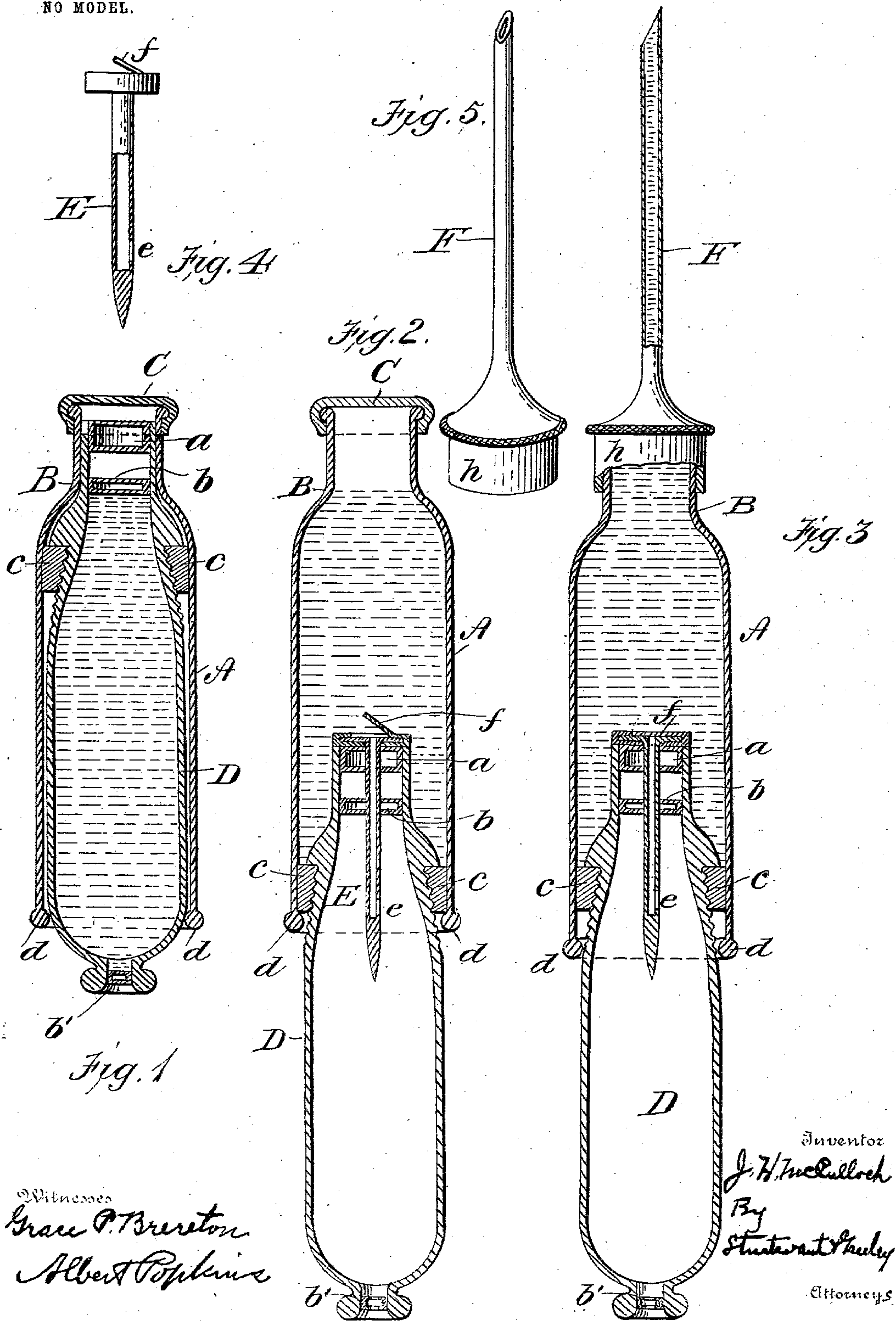


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J. H. McCULLOCH.
HYPODERMIC SYRINGE.
APPLICATION FILED JUNE 13, 1903.

NO MODEL.



Witnesses
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JOHN HOWARD McCULLOCH, OF NEWVILLE, PENNSYLVANIA.

HYPODERMIC SYRINGE.

SPECIFICATION forming part of Letters Patent No. 743,743, dated November 10, 1903.

Application filed June 13, 1903. Serial No. 161,351. (No model.)

To all whom it may concern:

Be it known that I, JOHN HOWARD McCULLOCH, a citizen of the United States, residing at Newville, in the county of Cumberland, State of Pennsylvania, have invented certain new and useful Improvements in Hypodermic Syringes, of which the following is a description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to an improvement in combined hypodermic syringes and serum-containers, the object being to provide a device in which the serum or other fluid may be retained in a hermetically-sealed package placed within the body of the syringe as a storage-receptacle and which serum-container when it is desired to use the fluid may first be drained into the body of the syringe by a movement of said serum-container, the latter then being used as a piston or plunger to drive home the fluid into the patient.

The invention comprises, primarily, a hypodermic-syringe body in combination with a serum-container which is adapted to act as a plunger or piston.

Secondly, it comprises a hypodermic-syringe body, a serum-container within the same having reciprocatory movement with respect thereto and engaging the inner wall thereof, whereby when the serum-container is punctured and the said container is reciprocated it may first cause the serum to flow from the container into the syringe-body and on the reverse movement to be expelled.

Thirdly, it comprises in addition to the other features a combined puncturing hollow plug and valve adapted to be connected with the container to allow of passage of the fluid through the container into the syringe-body and a hypodermic needle adapted to be secured to the syringe-body.

Finally, the invention consists in the matters hereinafter described, and referred to in the appended claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of a hypodermic-syringe body and container constructed in accordance with my invention. Fig. 2 is an elevation, partly in section, of the device when the combined container and piston is

being withdrawn to allow the serum to flow into the syringe-body. Fig. 3 is a similar view showing the hypodermic needle in position and the piston and container being forced in to expel the serum. Fig. 4 is a detail view of the plug and valve, and Fig. 5 is a detail view of the hypodermic needle detached.

In the drawings the body of the syringe is represented at A and is made of glass or other suitable material, narrowed at the top to form a neck B, over which a rubber cap C is adapted to fit. At its lower end the syringe-body A is opened and adapted to receive the serum-container D, constructed of any suitable material, provided at its upper end with a contracted neck, adapted to be closed at the mouth by a rubber packing *a* and lower down within the neck by a soft-metal packing *b*. Near the upper end said container D is provided with a washer of rubber or suitable material, as shown at *c*, screw-threaded thereon, this being of a size sufficient to form a tight joint with the inner wall of the syringe-body A. At its lower end the serum-container D projects beyond the syringe-body and has its lower end formed to be easily taken hold of by the fingers of the operator, the lower end being closed by soft-metal packing *b'*. The lower end of the syringe-body A is formed with an interior shoulder or flange *d*, designed to be engaged by the washer *c* when the serum-container is withdrawn to the lower end of the syringe-body, so as to prevent its accidental withdrawal therefrom and to form also a closed chamber.

E represents a hollow needle-plug having a pointed solid lower end and an opening *e* entering the tube and having at its upper end an outwardly-opening valve *f*.

When it is desired to use the device, the packing *b'* in the lower end of the serum-container is first punctured by the needle-plug E. The cap C is then removed and the needle-plug E forced down through the rubber packing *a* and soft-metal packing *b* until its head *g* fits over the mouth of the serum-container. (Replace rubber cap C.) The lower end of the container is then grasped and the container moved outwardly from the syringe, this action creating a vacuum in the syringe-

body and allowing the serum to flow out through the valve *f* into the body. Either before or after the plug *E* is inserted in the upper end of the container the needle *F*, which at its lower end is attached to a cap or head *h*, is placed over the neck of the syringe-body, and when the serum has flowed from the container into the syringe-body by the withdrawal action of the container on the inward movement of the latter the serum will be forced through the hypodermic needle into the body of the patient. The part *D* therefore acts as a serum-container and piston or plunger.

Various minor modifications and changes may be made without departing from the spirit of the invention.

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

1. A hypodermic syringe, comprising a body and a combined serum-container and serum-expelling device carried thereby with means for establishing communication between the serum-container and expelling device and the body; substantially as described.

2. A hypodermic syringe comprising a body, a serum container or receptacle therein, having an annular ring thereon snugly fitting the inner wall of the body portion, said serum-container being adapted to reciprocate within the syringe-body with means for establishing communication between the serum-container and expelling device and the body; substantially as described.

3. A hypodermic syringe comprising a body, a serum container or receptacle therein, having an annular ring thereon snugly fitting the inner wall of the body portion, said serum-container being adapted to reciprocate within the syringe-body, said body having an inwardly-projecting annular portion, against which the annular ring on the container strikes in the outward reciprocation thereof with means for establishing communication between the serum-container and expelling device and the body; substantially as described.

4. A hypodermic syringe comprising a body portion having an open lower end and having means at the upper end for the attachment of a hypodermic needle, a movable serum container or receptacle having means for forming a close joint with the inner wall of the body portion, and means for establishing communication between the serum-container and the body portion, whereby in the outward movement of the serum container or receptacle, the fluid may pass into the body portion and in the inward movement thereof, the fluid will be expelled through the needle; substantially as described.

5. A hypodermic syringe, comprising a body portion having an open lower end and having means at the upper end for the attachment of a hypodermic needle, a movable serum

container or receptacle, having means for forming a close joint with the inner wall of the body portion, a valved plug adapted to be placed within the upper end of the serum-container to establish communication between the same and the body portion, whereby in the outward movement of the serum container or receptacle, the fluid may pass into the body portion and in the inward movement thereof, the fluid will be expelled through the needle; substantially as described.

6. A hypodermic syringe comprising a body portion, and a hollow movable plunger or piston therein adapted to contain the serum or other fluid with means for establishing communication between the serum-container and the body portion; substantially as described.

7. A hypodermic syringe comprising a body portion, and a hollow movable plunger or piston therein adapted to contain the serum or other fluid, and a valved opening between said hollow piston or plunger and the body portion; substantially as described.

8. A hypodermic syringe comprising a body portion and a hollow movable plunger or piston therein adapted to contain the serum or other fluid, an annular washer surrounding the plunger or piston, and an annular shoulder at the outer end of said body portion with means for establishing communication between the serum-container and the body portion; substantially as described.

9. A hypodermic syringe comprising a body portion, and a hollow movable plunger or piston therein adapted to contain the serum or other fluid, and a hollow tube or plug, with a valve at the outer end thereof opening into the body portion; substantially as described.

10. A hypodermic syringe comprising a body portion, and a hollow movable plunger or piston therein adapted to contain the serum or other fluid and having openings at its upper end adapted to be closed by suitable packing, a puncturing hollow valved tube adapted to be forced through the packing and establish communication between the piston and the body portion, and a hypodermic needle adapted to be secured to the body portion; substantially as described.

11. A hypodermic-syringe body, a serum-container within the same and having reciprocating movement with respect thereto, and engaging the inner wall thereof, whereby when the serum-container is punctured and reciprocated, it may first cause the serum to flow from the container into the syringe-body, and on the reverse movement to be expelled from the syringe-body; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN HOWARD McCULLOCH.

Witnesses:

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