

H. L. REED.
 SERUM CONTAINER AND INJECTOR.
 APPLICATION FILED OCT. 2, 1914.

1,139,720.

Patented May 18, 1915.

Fig. 3.

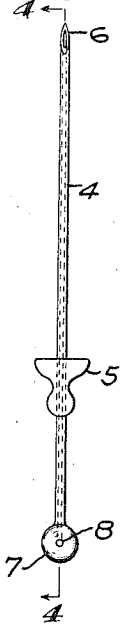


Fig. 4.

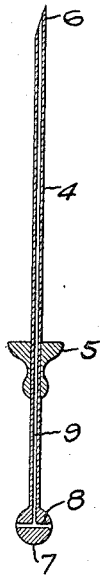


Fig. 1.

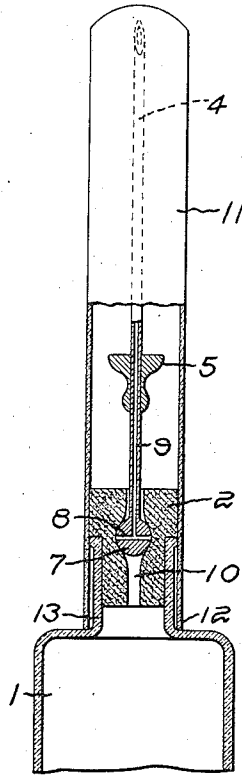


Fig. 2.

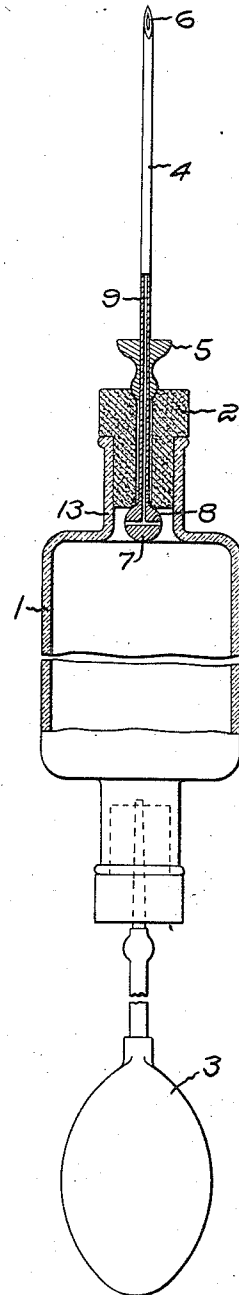


Fig. 7.

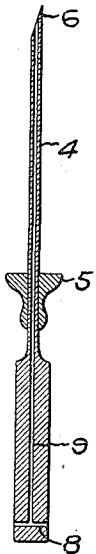


Fig. 5.

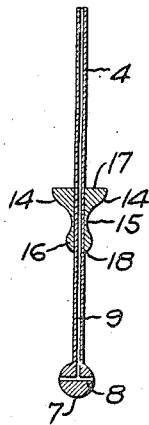
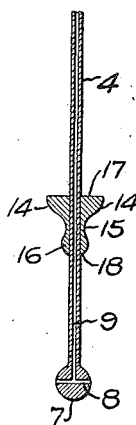


Fig. 6.



Witnesses:
 Carl L. Choate.
 Horace A. Crossman.

Inventor:
 Harry L. Reed,
 by Jimmy North James Tamm
 Attys.

UNITED STATES PATENT OFFICE.

HARRY L. REED, OF DORCHESTER, MASSACHUSETTS.

SERUM CONTAINER AND INJECTOR.

1,139,720.

Specification of Letters Patent.

Patented May 18, 1915.

Application filed October 2, 1914. Serial No. 864,689.

To all whom it may concern:

Be it known that I, HARRY L. REED, a citizen of the United States, and a resident of Dorchester, county of Suffolk, and Commonwealth of Massachusetts, have invented an Improvement in Serum Containers and Injectors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My invention relates to a device for storing and injecting serum, and its purpose is to provide an improved container adapted preferably to contain, in each case, a sufficient quantity of serum for one injection, and also to receive means for expelling the serum therefrom, and also to provide an improved needle for injecting the serum.

In the drawing of the particular embodiment of my invention described and illustrated herein, Figure 1 is a sectional view of the needle, its sheath, and a container closed with the needle secured to the closure, as the container may conveniently be supplied to purchasers, the container being partly broken away; Fig. 2, a similar view with the needle sheath removed and the needle in position in the container for use; Fig. 3, a side view of my improved needle; Fig. 4, a vertical longitudinal section thereof on the line 4-4, Fig. 3; Fig. 5, a view on an enlarged scale of the separate parts of the needle before assembly; Fig. 6, a similar view with the several parts of the needle assembled, and Fig. 7, a vertical section of a modified form of needle.

Referring now to Figs. 1, 2, my container and injector is illustrated as comprising a vessel 1 of any suitable shape and material, as glass, adapted preferably to contain the proper quantity of serum for one injection. After the serum has been placed in the container its two ends are preferably normally closed air-tight at the laboratory, one end, see Fig. 1, being provided with a compressible needle carrying stopper or other suitable closure 2, such as rubber or cork, while the opposite end is provided with a stopper or adapted, in any suitable manner, to receive a bulb 3 or other suitable means for providing pressure for forcing the serum from the container and through the needle.

The needle 4 comprises, as shown, Figs. 1, 2, 3, 4, a small, slender hollow tube of suitable material as metal, commonly

called the cannula, with a passage closing hub 5 intermediate its ends.

The outer end 6 of the needle is pointed so that it can be readily caused to pierce the skin. The needle, preferably near or at its inner end is provided with a passage-sealing and needle-retaining section or member 7, and shown herein as substantially spherical. A lateral passage 8, through this member 7 connects with the longitudinal passage 9, of the needle and thereby establishes, when the needle is in proper position, communication between the passage 9 and the interior of the container, see Fig. 2.

It is desirable that the container be substantially sealed after the serum has been placed therein, and the serum protected from impurities of all kinds. For this purpose the container is provided with a suitable closure, referred to, and to provide means for conveniently carrying the needle and for readily establishing communication between the needle and container interior, I mold or otherwise form a narrow passage or slit in the closure 2 of a size to conveniently receive the sealing end 7 of the needle 4, and the closure will then naturally expand and close up tightly about the needle and thus form a satisfactory seal for the upper container end, see Fig. 1.

The hub 5 is preferably secured to the needle at such point as will permit it to fairly enter and close the upper end of the passage 10 of the closure 2 when the spherical sealing end 7 of the needle is pushed through the closure and into the container, see Fig. 2.

The needle, when in position in the closure, may be and preferably is, after being sterilized, inclosed in a needle sheath or container 11, as of glass, the lower end 12 of which may be conveniently sealed to the neck 13 of the bottle in any desired manner.

When the container is to be used, the needle sheath 11 is removed by breaking the seal between the same and the container, the needle 4 is then grasped by means of the hub 5, and the inner or spherical sealing end 7 of the needle is pushed through the passage 10 into the container, see Fig. 2. As the spherical end 7 leaves the passage 10 at one end, the hub 5 enters it at the opposite end and effectually closes it against the air or contents of the container.

The outer end of the needle is next inserted beneath the skin and the serum forced

therethrough by means of the bulb 3, or other convenient means. By providing the spherical sealing end 7 of the needle with the lateral passage 8, I find that the passage
 5 is less likely to be choked by any small particle of the closure than is the case where the longitudinal passage of the needle is extended through the inner end of the needle; and the needle thrust through the closure to
 10 establish communication with the container, the latter operation frequently resulting in the lodging in the needle passage of small particles of the closure thereby partly or entirely obstructing the passage; and to further
 15 guard against such accident, the edge of the passage 8 may be counter bored or beveled. The spherical sealing end 7 also acts to prevent the needle from being accidentally withdrawn from the closure or from being
 20 forced therefrom by the pressure from the bulb 3, and it acts also, when the needle is in use as a seal against the escape of the contents of the container through the passage in the closure.

25 By first forming a passage through the closure to receive the needle, I am enabled to thrust the needle therethrough more easily and quickly than can be done where the stopper is solid and the inner end of the
 30 needle is sharpened to be thrust therethrough; and the enlarged sealing end of the needle acts as a satisfactory seal for the passage in the closure at its inner end as does the hub 5 at the outer end.

35 While the passage closing hub 5 may be secured to the needle in any desired manner, I have conceived a novel and satisfactory way of so doing. Heretofore it has been
 40 common to secure a hub to a cannula by soldering it thereto. This method is not only slow and expensive but the heating of the cannula during this operation weakens it.

45 I have conceived the idea of swaging the hub to the cannula and I am able thereby to quickly and securely lock the parts together. For performing this step in the operation of making the needle, I provide, Fig. 5, a generally inverted pyramidal shaped member,
 50 the opposed converging faces 14—14, of which are, however, recessed to a considerable extent to form a relatively narrow neck 15 from which a curvilinear, substantially globular part 16 depends. This hub is first
 55 drilled longitudinally to receive the cannula snugly therein. The hub is next placed in any suitable machine and pressure applied to the substantially flat upper face 17 and the lower face 18 of the globular part 16 and the hub is compressed thereby, causing the
 60 neck 15 to collapse inwardly and to tightly grip the cannula. The length of the hub is slightly lessened by this operation, Fig. 6, and the diameter of the neck also slightly increased.

65 By means of the foregoing operation the

two members, cannula and hub forming the needle, may be expeditiously and effectively secured at a minimum of expense.

A needle made as described is also less expensive for the reason that it comprises
 70 only two members. It is common at this time to make needles of three or more parts which necessitates much expense both in the manufacture of parts and also in the cost of assembling them.

75 In Fig. 7 I have illustrated a modified form of my invention wherein the cannula, instead of being provided with an enlarged portion at a particular point thereon only, is enlarged near the point where the hub is
 80 secured, and thus continued to its lower or inner end. This end of the cannula is provided with one or more lateral passages 8 to connect the longitudinal passage of the cannula with the interior of the container.

85 The enlarged inner end, as described, by its more extended contact with the wall of the passage 10 through the closure 2, acts also as an effective seal for the passage and the gripping by the closure of the enlarged
 90 needle end acts to prevent the needle from being loosened in or expelled from the closure passage under any reasonable operating conditions.

95 Obviously, it is possible to modify the embodiment of my invention as described and illustrated herein in many details without departing from the spirit thereof and within the appended claims.

Claims:

- 100 1. In an apparatus of the class described the combination of a container having an opening, a needle-gripping closure therefor having a passage therethrough, the container adapted to receive means for expelling
 105 the contents therefrom, and a needle having a passage closing member thereon, a passage-sealing and needle-retaining member also thereon, and a passage extended longitudinally of the needle and laterally
 110 of the passage-sealing member.
2. In an apparatus of the class described the combination of a container having an opening, an expansible needle receiving and carrying closure therefor having a slit there-
 115 through, the container adapted to receive means for expelling its contents therefrom, and a needle having a slit closing member thereon, a slit-sealing and needle-retaining member adjacent one end of the needle, and
 120 a passage extended longitudinally of the needle and laterally of the slit-sealing member.
3. In an apparatus of the class described, the combination of a container having an
 125 opening, a closure therefor having a passage therethrough, a needle in said passage and normally sealing the same and closing communication with the container, and adapted to be thrust through the mouth of the pas-
 130

sage into the container to establish communication therewith.

4. A hypodermic needle having a passage-closing member thereon, and a passage-sealing and needle-retaining member also thereon having the needle passage extended laterally therethrough.

5. A hypodermic needle having a passage-closing member thereon, a passage-sealing and needle-retaining member also thereon, the needle passage extended laterally through said passage-sealing member.

6. A hypodermic needle having a passage-sealing and needle-retaining member thereon with the needle passage extended laterally therethrough.

7. A hypodermic needle having a curvilinear passage-sealing and needle-retaining member and a passage extended laterally thereof and leading to the needle passage.

8. A hypodermic needle having a passage-closing member thereon, a passage-sealing and needle-retaining member also thereon with a passage laterally thereof, the closing

and sealing members so disposed on the needle as to abut the respective ends of a container closure member when the needle is thrust therethrough.

9. In an apparatus of the class described, the combination of a container closure, and a needle having a passage closing member thereon, a passage sealing and needle retaining member also thereon, the passage closing member and passage sealing member so positioned on the needle that, when the latter is thrust through the closure, said passage sealing and passage closing members will engage respectively opposite ends of the closure to effectually seal the passage therethrough.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HARRY L. REED.

Witnesses:

EVERETT S. EMERY,
ROBINA MACDONALD.