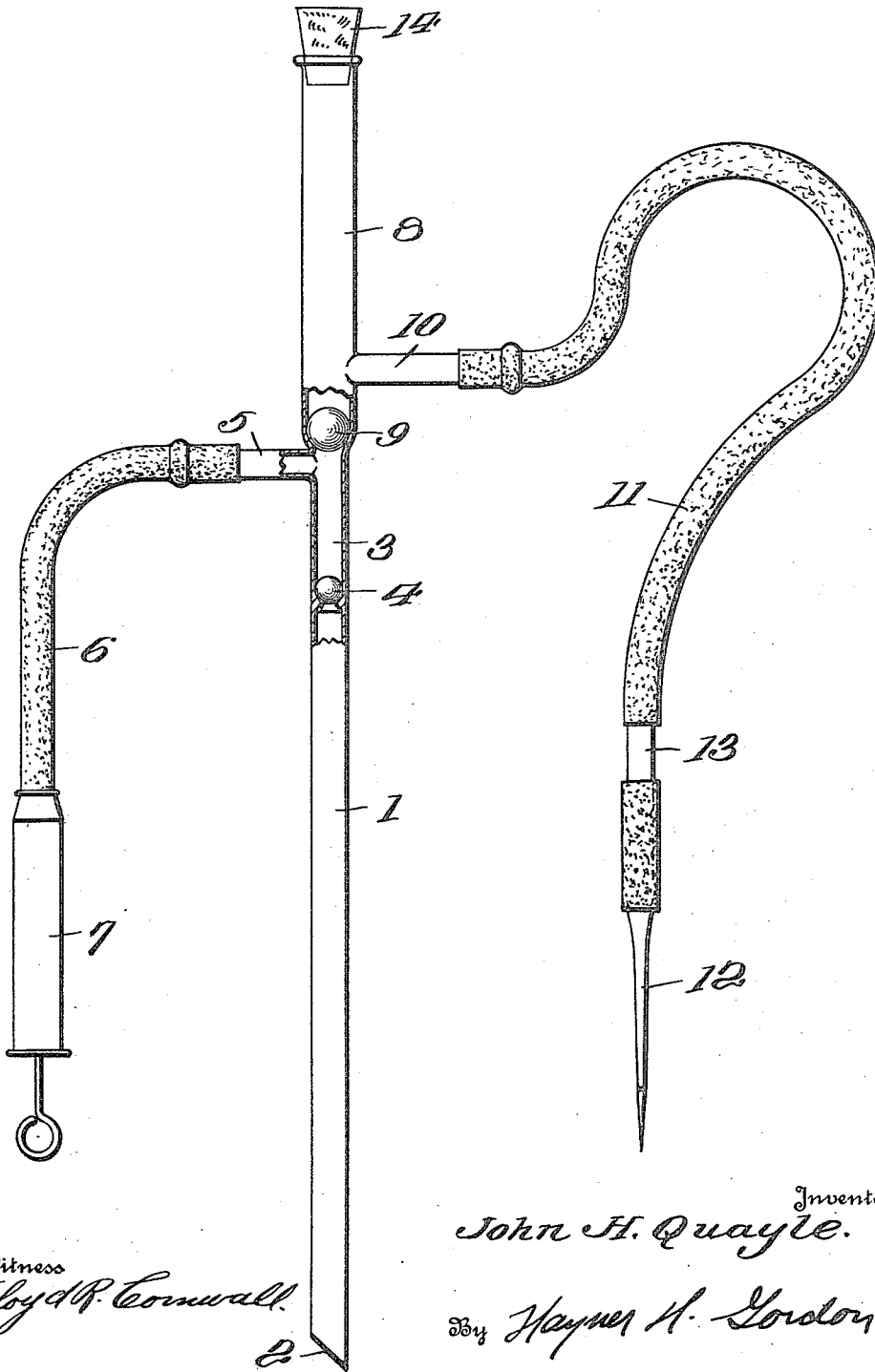


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INTRAVENOUS INJECTION APPARATUS.  
APPLICATION FILED JUNE 20, 1918.

1,282,000.

Patented Oct. 15, 1918.



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## INTRAVENOUS-INJECTION APPARATUS.

1,282,000.

Specification of Letters Patent. Patented Oct. 15, 1918.

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*To all whom it may concern:*

Be it known that I, JOHN H. QUAYLE, a citizen of the United States, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Intravenous-Injection Apparatus, of which the following is a specification.

This invention relates to apparatus for intravenous injections in which drugs or solutions are injected into the veins of the circulatory system of the human body as typified more particularly by the injection of salvarsan in the treatment of syphilis.

The general object of the present invention is to provide an apparatus simple in character and readily sterilizable by means of which intravenous injections may be quickly and safely given.

It is a further object of the present invention to provide an apparatus wherein the introduction of air or particles of solid matter along with the solution is prevented.

A further object is a device so constructed as to give an indication to the operator of the entry of the needle into a vein.

A still further object is the provision of an apparatus in which all of the above functions are present in a unitary structure of simple design.

Further objects will appear in the course of the following disclosure.

In order to better illustrate the present invention and to enable a full understanding thereof to be had, reference is now made to the accompanying drawing which forms a portion of this specification and in which the figure is a side elevational view of one form of the invention.

The apparatus, as shown, consists of a cylindrical glass tubular member 1, the lower end 2 of which is beveled off at a sharp angle, the member having a check valve 4 located therein as shown and seating against a constriction to form a chamber 3. The valve 4 may be of either metal or glass preferably ground in its seat, and, if desired, the chamber 3 may be of larger diameter than the bottom portion 1. Extending laterally from this enlarged tubular portion or chamber 3 is a connecting tube 5 adapted to receive a rubber tube 6 which in turn is connected with a glass syringe 7 of the usual type. Just above the lateral extension 5 an enlargement of the tubular member occurs, forming a second chamber 8 communicating with chamber 3

by means of a second check valve 9 similar in construction to the valve 4, but of larger diameter. The progressive enlargement of the tubular member permits of the ready removal or insertion of the check valves, valve 4 passing readily through the valve orifice of check valve 9.

Just above the check valve 9 a connecting tube 10 extends laterally from the chamber 8 which is adapted for the reception of a rubber tube 11 connected to a hypodermic needle 12 of any preferred type, an indicator consisting of a short portion of glass tubing 13 being inserted in the rubber tube 11 just back of the needle if desired. A cork or stopper 14 for closing the chamber 8 completes the apparatus.

In using the apparatus for intravenous injections it is first sterilized, a procedure readily accomplished by boiling the complete apparatus, and in which, owing to the entire absence of glass stop cocks or other complicated structure, there is little danger of breakage. After sterilization the lower tubular portion 1 of the apparatus is inserted in a suitable container of salvarsan or other desired solution, which is then drawn up into the apparatus and syringe by manipulation of the same, the stopper 14 at this time being removed. The rod of the syringe is then depressed, so that the tube 11, needle 12 and a portion of the chamber 8 become filled with the solution. In connection with this operation it is to be noted that the beveled end 2 of the tubular member effectively prevents the gathering up of any solid or foreign particles in the solution which have settled to the bottom of the container, and any air in the system rises to the chamber 8 and escapes, so that the entrance of either solid matter or air bubbles into the circulatory system by the use of the apparatus is obviated.

As soon as the device has been filled with solution, the puncture is made with the needle in the usual manner, a successful entrance into the vein being at once indicated by a slight rise of the level of the solution in the chamber 8, owing to the venous pressure of the blood being communicated to this chamber through the tube 11. Immediately upon this indication the stopper 14 is inserted, and the injection of the solution is begun by means of the syringe 7, the chamber 8 now having the additional function of an air chamber to produce a steady

flow of solution independent of the impulse of the syringe, as well as acting as an air separator or collector, the apparatus thus combining all the advantages of both the gravity and pressure systems without any of the dangers attendant upon the use of either.

While the above represents a preferred embodiment of the invention, it is to be understood that all rights are reserved to such changes and modifications as may fall within the scope of the appended claims.

What I claim is:

1. In an intravenous injection apparatus, the combination with a hypodermic needle and syringe, of a tubular member comprising a bottom portion, an intermediate chamber included between check valves and having a connection with said syringe, and an air separating and venous pressure indicating chamber located above said intermediate chamber and having connection with said hypodermic needle.

2. In an intravenous injection apparatus, the combination with a hypodermic needle and syringe, of a tubular transparent member comprising a bottom portion the lower end of which is beveled, an intermediate chamber included between check valves and having a connection with said syringe, an air separating and venous pressure indicating chamber located above said intermediate chamber and having connection with said hypodermic needle, and means for placing said air separating and indicating chamber in communication with the atmosphere when desired.

3. An intravenous injection apparatus comprising in combination, a unitary tubular structure having a bottom portion adapted to be immersed in a liquid, an intermediate portion in communication with said bottom portion through a check valve and having a lateral tubular extension for connection to a syringe, and a top transparent por-

tion in communication with said intermediate portion through a second check valve and having a lateral tubular extension for connection with a hypodermic needle, and means to place said top portion in communication with said atmosphere at will.

4. An intravenous injection apparatus comprising in combination a unitary tubular transparent structure having a beveled bottom portion adapted to be immersed in a liquid, an intermediate portion in communication with said bottom portion through a check valve and having a lateral tubular extension for connection to a syringe, and a top portion in communication with said intermediate portion through a second check valve and having a lateral tubular extension for connection with a hypodermic needle, and means to place said top portion in communication with said atmosphere at will.

5. An intravenous injection apparatus comprising in combination a unitary tubular multiple diametered transparent structure having a bottom portion adapted to be immersed in a liquid, an intermediate portion having communication with said bottom portion through an upwardly opening check valve, a lateral tubular extension therefrom for connection to a syringe, and a top portion of larger diameter than said intermediate portion and having communication therewith through a second upwardly opening check valve, a lateral tubular extension from said top portion for connection to a hypodermic needle, the ratio of diameters of said top portion to said intermediate portion being such that said first mentioned check valve may be removed through the seat of said second check valve, both of said valves being removable through said top portion.

In testimony whereof I have hereunto set my hand.

JOHN H. QUAYLE.