Dec. 22, 1931. J. F. WILLIAMS 1,838,026

APPARATUS FOR TREATING BLOOD STREAMS

Filed Aug. 26, 1930 3 Sheets-Sheet 1

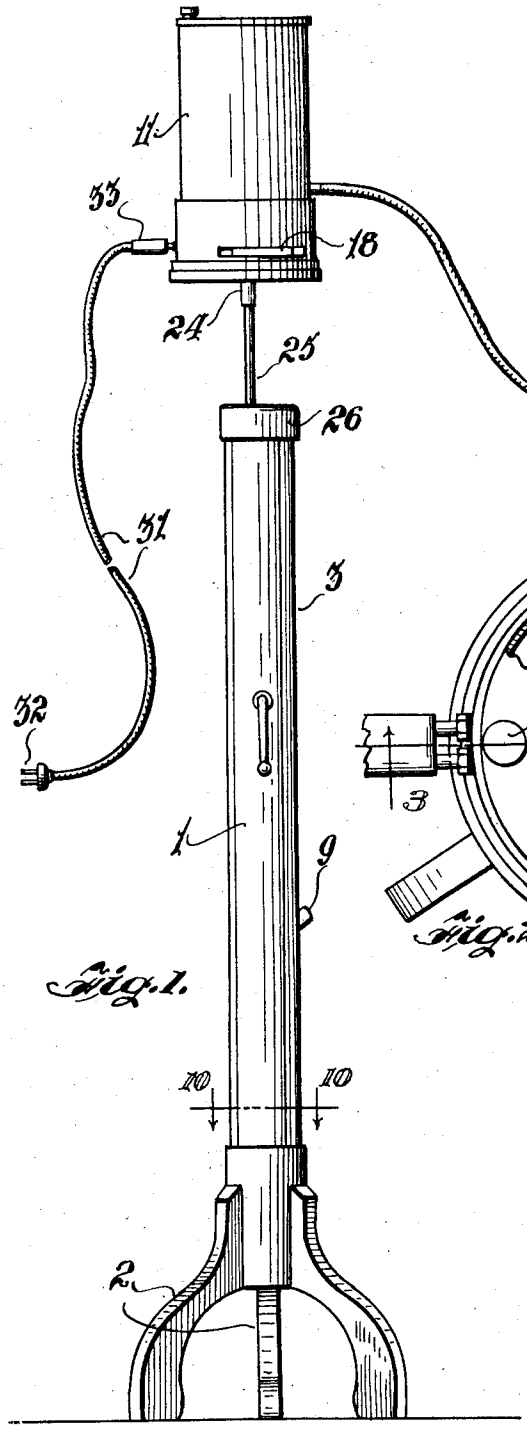


Fig. 1.

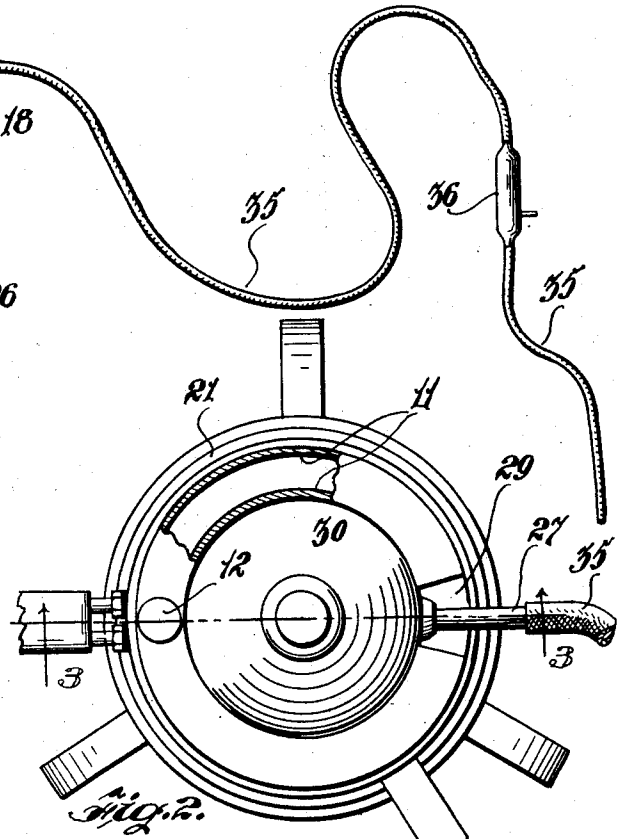


Fig. 2.

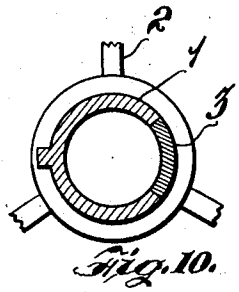


Fig. 10.

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APPARATUS FOR TREATING BLOOD STREAMS

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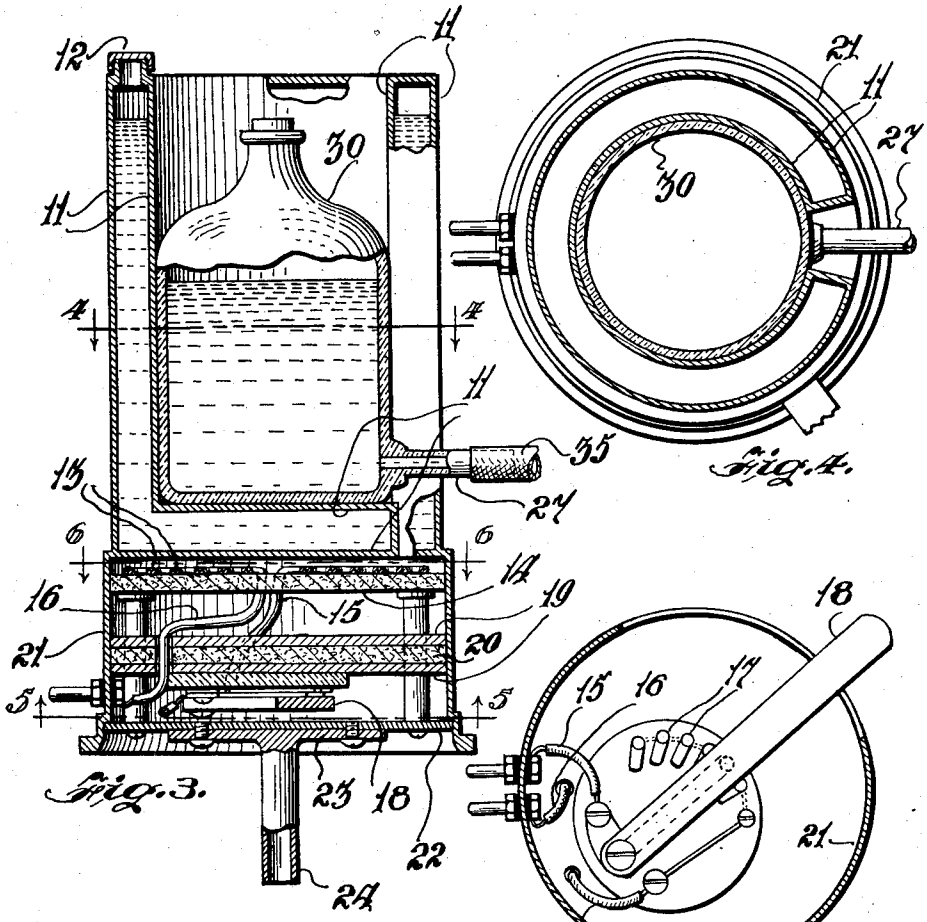


Fig. 3.

Fig. 4.

Fig. 5.

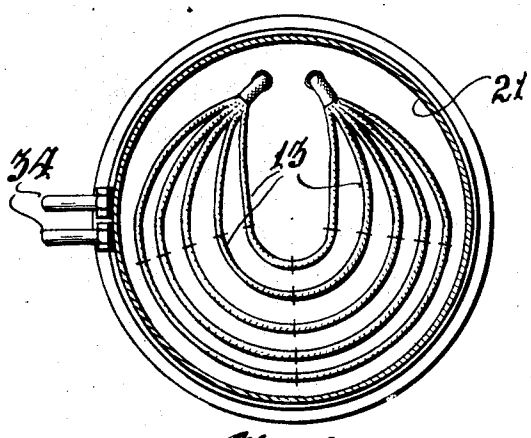


Fig. 6.

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APPARATUS FOR TREATING BLOOD STREAMS

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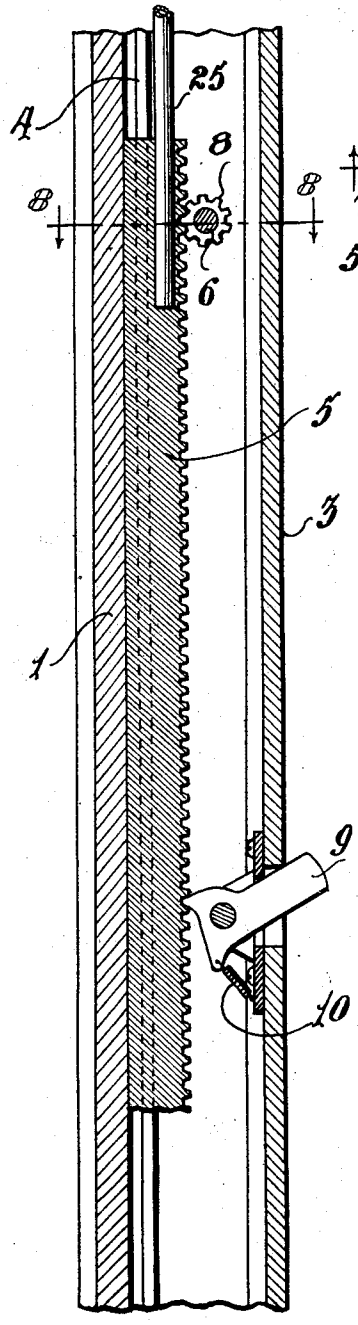


Fig. 7.

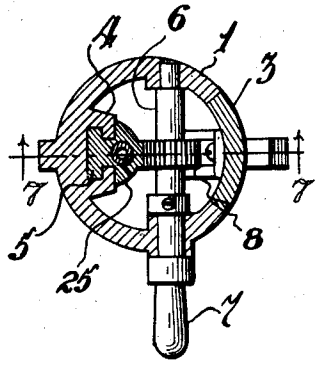


Fig. 8.

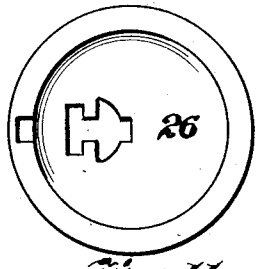


Fig. 11.

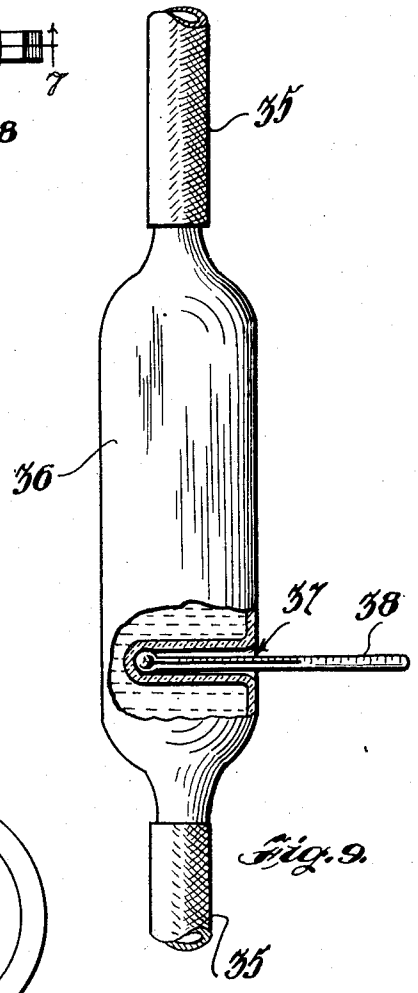


Fig. 9.

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Patented Dec. 22, 1931 1,838,026

UNITED STATES PATENT OFFICE

JAMES FORREST WILLIAMS, OF TEXARKANA, TEXAS

APPARATUS FOR TREATING BLOOD STREAMS

Application filed August 26, 1930. Serial No. 477,949.

The primary object of my invention is to provide an apparatus for the treatment of the blood stream by the injection therein of water or other liquids or combinations of liquids under pressure, or for bladder or colonic injections. For this purpose I have provided an arrangement of parts which consists of a container for the liquid to be injected, and adjustably mounted for convenient handling and operation, a means for heating the liquid and for regulating the degree of heat applied thereto, a means for conveying the liquid thus heated from the container to the blood stream of the patient, and including a novel means for the introduction of a thermometer into the stream of liquid being injected.

With the above and other minor yet important objects in view, my invention will be better understood from a perusal of the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and wherein:

Figure 1 is a side elevational view of the entire invention in operable position.

Figure 2 is a top plan view, partly broken away, of Figure 1.

Figure 3 is a vertical sectional view of Figure 2, the view being had along the line 3—3 thereof and showing the interior arrangement and construction of the heating means and the liquid container.

Figure 4 is a cross-sectional view, taken on the line 4—4 of Figure 3, and Figures 5 and 6 are similar views, taken on respective figure lines thereof.

Figure 7 is an enlarged detail vertical sectional view of the adjustable support for the liquid container, the view being broken away at each end, and taken on line 7—7 of Figure 8.

Figure 8 is a cross-sectional view on the line 8—8 of Figure 7.

Figure 9 is an enlarged detail view of a tube for the insertion of a thermometer for obvious purposes.

Figure 10 is a cross-sectional view along the line 10—10 of Figure 1 showing the construction of the walls of the supporting means for the container, and

Figure 11 is a top view of the cover for the supporting means.

Referring more in detail to the drawings, in Figure 1, I have shown a means for supporting the liquid container which consists of a hollow cylindrical body 1, shown in detail in Figure 7, supported upon legs 2. This may be made of wood or other suitable material and has a removable portion 3, the entire length of the body for the purpose of gaining access to the interior. In the body there is formed a rib 4 which is channeled in the form of a T and provides a slide-way for a similar shaped rack-bar 5, shown clearly in Figure 7. This rack bar provides a means for lifting and raising the container and heating parts of the invention, more particularly described hereinafter. Spaced across the walls of the body 1 is a small shaft 6 with a crank handle 7 and on the shaft is carried a small gear 8 and it will be obvious that since the gear is in mesh with the teeth of the rack bar 5, rotation of the shaft will raise and lower the rack bar. There is also an arrangement for holding the rack bar in adjusted position, provided by the member 9, in connection with the spring 10, the member being shifted upwardly or downwardly when the rack bar is to be moved and positioned according to requirements.

Referring to Figures 2 to 6, inclusive, in Figure 3 is shown the heating means and the liquid container. The heating means consists of a tank with walls 11, closed at the top, with the exception of a filler opening 12, water being placed in the tank and heated to desired temperature by the coils 13. These coils are supported upon an insulating medium 14 and have two lead connections 15 and 16, the lead 15 having connection with a switch, 17 indicating the contact points thereof, the electric current being raised or lowered through the shifting of the handle or switch arm 18. The switch is properly insulated and there are also provided plates 19 between which is supported a heat retaining medium 20. These parts are all enclosed by an extension or continuation of the walls

of the tank as at 21 and at the bottom is a plate 22. To this latter plate is secured a smaller plate 23, formed integrally with a hollow rod 24 for the purpose of connecting the heating means and container to the stand or support 1. In Figure 7 is shown a rod 25 which passes through the cover 26 of the stand and is seated in the upper end of the rack bar 5. Thus the tank and heating arrangement can be easily taken off or removed from the stand when required by means of the hollow rod 24.

In Figure 2 it will be observed that the tank walls 11 stop short of making a complete circle so as to form a gap or break therein for the passage of a tube 27, the break or gap being indicated at 29. This tube forms part of a bottle or other receptacle 30 and carries the liquid for injecting purposes. This receptacle seats in the space formed by the circular arrangement of the walls and the contents are heated by the coils and water carried in the tank formed by these walls. The coils are heated by a source of electric current through the cord 31 which embodies the two wires whereby a socket connection is made with the electric current by the knife plug 32. The cord 31 likewise carries the usual connector 33 for attachment to the contact arms 34 in the usual way.

To the tube 27 is attached a flexible tube 35 for conveying the heated liquid to the patient. Intermediate the ends of this tube is placed a bulb, illustrated more clearly in Figure 9. The walls of this tube are directed inwardly to form a pocket or well 37, for the insertion of a thermometer 38, the purpose of which is obvious.

In the operation of the apparatus the tank formed by the walls 11 is filled with water, and likewise the container 30 is supplied with water or other liquid with which it is desired to inject either into the blood stream or bladder or colon. The apparatus is designed to give intravenous injections of fluids hypodermoclysis proctoclysis or irrigations of any character, that is, colonic or bladder, the proper temperature being maintained indefinitely by the specialized heating arrangement whereby the water or liquid in the container is heated indirectly through the tank or reservoir. When the water in this tank is heated to a temperature around 110 degrees Fahr. the fluid in the container 30 will be at about 99 degrees Fahr. and recorded in the bulb 36 by the thermometer 38. While I have shown the container below the top wall of the water tank, the container can be made to project slightly above the tank for convenience, and likewise the container can be supplied with a gage if preferred. A needle (not shown) is carried on the free end of the tube 35 when needed to pierce the patient's skin. The tank and container can be easily raised and lowered and held in the desired position as heretofore explained, and the whole apparatus is portable.

While I have shown a practical working embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed, but my invention is capable of modifications and alterations, such as would be within the range of equivalents and in keeping with the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In an apparatus of the character described, the combination of an adjustable upright support, a double-walled tank seated on the support and including a cavity, a liquid container carrying injecting fluid removably seated in said cavity; a hollow base on the tank, an electric coil and switch carried in the base; a flexible tube carrying a bulb and connected to the container for directing the flow of injecting fluid to the patient; and means in said support for raising and lowering said container and coil to a convenient height for operation.

2. In an apparatus of the character described, the combination of an adjustable upright support, an element reciprocably secured in the support and carrying a member projecting beyond the support; a double-walled tank removably seated on said projecting member and including a cavity, a liquid container seated in the cavity of the tank, an electric heater coil and switch for varying the current flow to proper degree of heat for the tank; means for moving said reciprocable element upwardly and downwardly, means for holding said element in an adjustable position; said liquid container including an outlet with a projecting end extending beyond the walls of the tank; a flexible tube carrying a bulb and connected to said projecting end of the outlet for conveying the injecting liquid to the patient, said bulb including means for insertion of a thermometer.

3. In an apparatus of the character described, the combination of an adjustable upright support, an element reciprocably secured in the support, means in the support for manually lifting and lowering said reciprocable element; a double-walled tank removably attached to the reciprocable element and including a cavity, said double walls including side walls and a bottom; a container seated in said cavity and carrying injecting fluid and including a projection, an opening in the side walls for the projection; a tube connected to the projection and carrying a bulb with a well for insertion of a thermometer, said tube adapted to carry a needle.

In testimony whereof I affix my signature.

DR. JAMES FORREST WILLIAMS.