

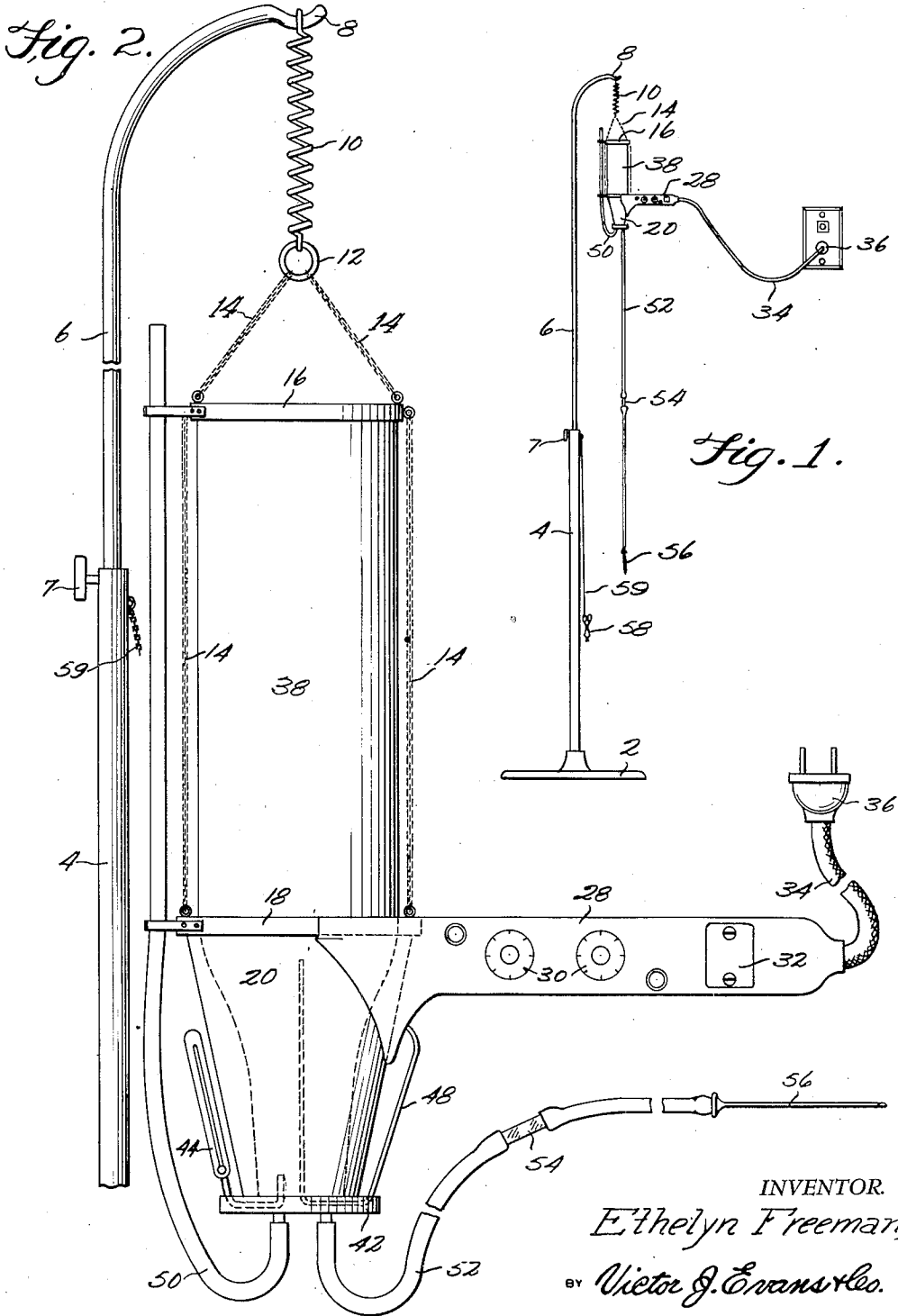
May 17, 1949.

E. FREEMAN
FLUID HEATER

2,470,481

Filed Nov. 15, 1946

3 Sheets-Sheet 1



INVENTOR
Ethelyn Freeman,
BY *Victor J. Evans & Co.*

ATTORNEYS

May 17, 1949.

E. FREEMAN
FLUID HEATER

2,470,481

Filed Nov. 15, 1946

3 Sheets-Sheet 2

Fig. 3.

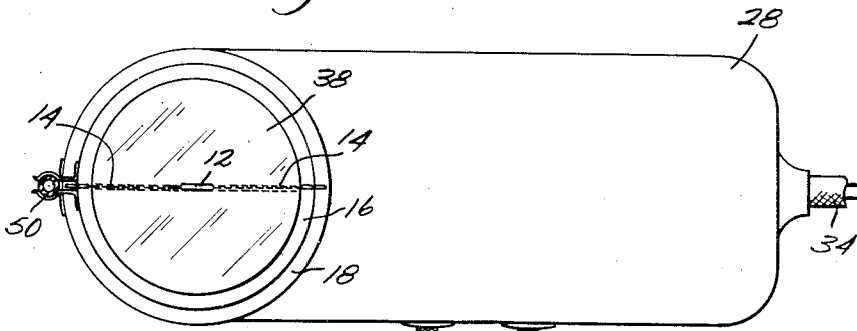
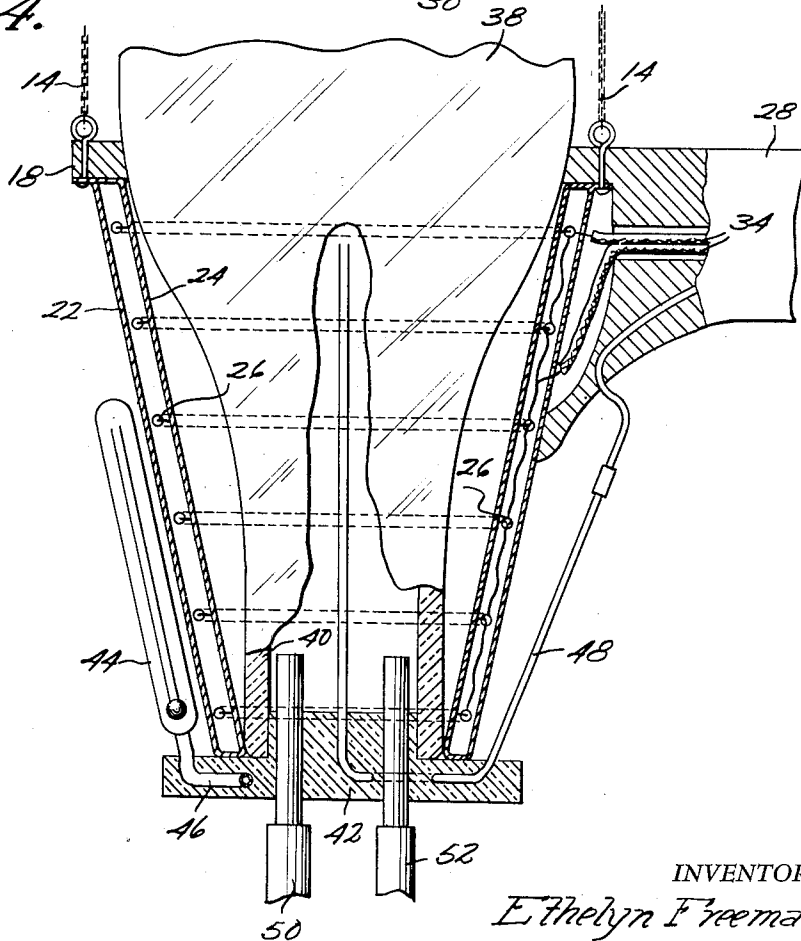


Fig. 4.



INVENTOR.
Ethelyn Freeman,
BY *Victor J. Evans & Co.*

ATTORNEYS

May 17, 1949.

E. FREEMAN
FLUID HEATER

2,470,481

Filed Nov. 15, 1946

3 Sheets-Sheet 3

Fig. 5.

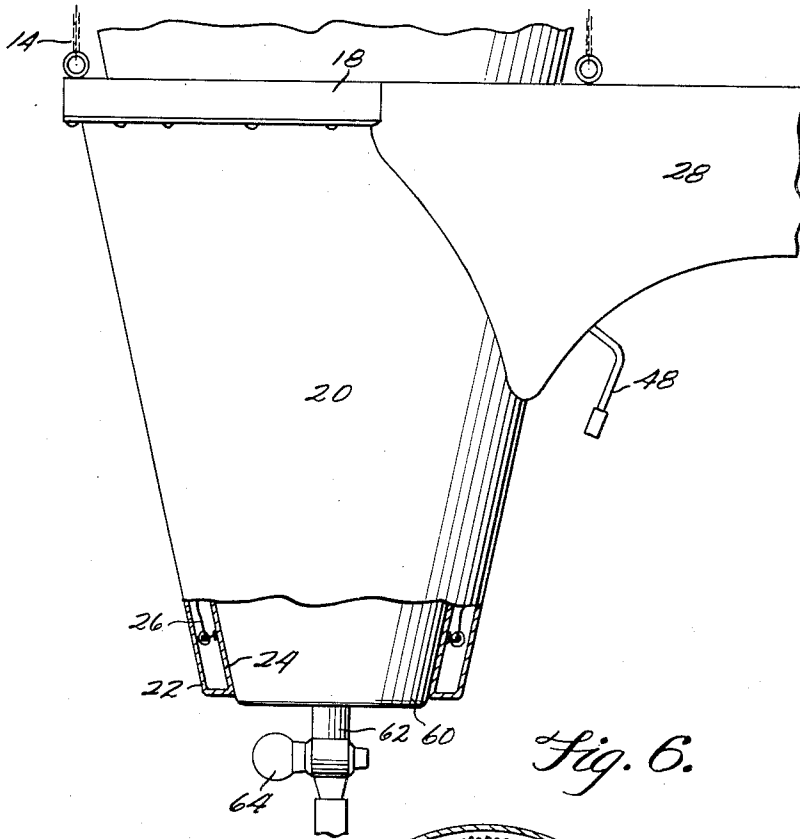


Fig. 6.

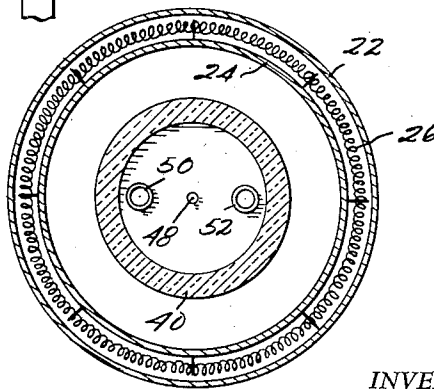
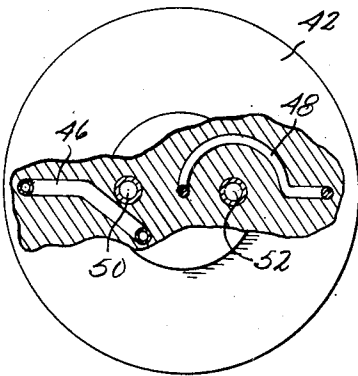


Fig. 7.



INVENTOR.

Ethelyn Freeman,

BY *Victor J. Evans & Co.*

ATTORNEYS

UNITED STATES PATENT OFFICE

2,470,481

FLUID HEATER

Ethelyn Freeman, Muskogee, Okla.

Application November 15, 1946, Serial No. 709,947

1 Claim. (Cl. 128—214)

1

My present invention relates to an improved fluid heater and more particularly to a heater for containers of intravenous injections of glucose or saline solutions, and blood plasma.

It will be appreciated that such injections should be of the same temperature as the body temperature of the patient to avoid reactions from the injections of cool fluid into the blood stream, and for that reason the heater of my invention is so constructed as to automatically maintain the temperature of the fluid to be injected at the desired degree comparable with that determined to be the body temperature of the patient.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention according to the best mode I have thus far devised but it will be understood that various changes and alterations may be made in the exemplified structure within the scope of the appended claim.

In the drawings:

Figure 1 is a plan view of the heater of my invention with the supporting structure and controls.

Figure 2 is an enlarged detail elevational view of the heater.

Figure 3 is a top plan view.

Figure 4 is a vertical sectional view through the heater.

Figure 5 is a view of the heater with a plasma receptacle.

Figure 6 is a horizontal sectional view of the heater and the bottle container for glucose or saline fluids.

Figure 7 is a partial sectional view of the cap for the bottle container.

Referring now to the drawings wherein like characters indicate like parts, I have illustrated the present embodiment of my invention as comprising a base 2 for the tubular post 4 in which is provided a telescoping rod 6 secured by screw 7 and formed with an upper hook 8.

The spring 10 supported from the hook 8 has a ring 12 to which is attached the chain 14 secured to the upper supporting ring 16. A lower ring 18 also carried by the chains 14 has attached thereto the heater 20 comprising the spaced walls 22 and 24 with the heating elements 26 therebetween.

A supporting arm 28 extends laterally of the ring 18 and carries thereon the thermostats 30 and a fuse box 32 from which the wires 34 lead to the plug 36 for connection with a source of electricity.

A bottle container 38 containing glucose or

2

saline solution formed with a neck 40 is positioned in inverted relation in the heater 20 and the cap 42 seals the open neck. The thermometer 44 is provided with a tube 46 leading into the neck of the bottle through the cap to indicate the temperature of the contents. A heat transfer element 48 connects with the thermostat and thus the heating elements will be controlled by the thermostat to maintain the temperature at the proper set level.

An air vent 50 comprising a flexible tube is secured in the clamps 51 on the rings 16 and 18, and a fluid passage tube 52 leads from the cap 42, the glass insert 54 permitting the examination of the contents of the tube in its passage to the conventional needle 56. A clamp cutoff 58 is secured by chain 59 to the post 4 to provide a quick means of stopping the flow of fluid is necessary.

In Figure 5 I have illustrated the heater in use with a blood plasma container 60 having an outlet 62 and a valve 64.

In the various uses of the heater of my invention, the container is of heat proof glass or other suitable material, and by the use thereof an improved and more accurate technique may be employed resulting in intravenous injections with reduced possibility of reaction to the patient.

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

A heater for a container for intravenous fluid injections comprising a stand, spaced supporting rings for suspending the container in an inverted position from the stand, a pair of spaced heating walls having electrical heating elements carried by said supporting rings therebetween, said walls forming a base for the container, temperature controls for the heating elements, a cap for the inverted container, a vent for the container through the cap, and an injection tube extending through the cap.

ETHELYN FREEMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,479,451	Buckstein	Jan. 1, 1924
1,956,067	Herz	Apr. 24, 1934

FOREIGN PATENTS

Number	Country	Date
137,316	Great Britain	Mar. 10, 1921