March 28, 1944. F. LANDAUER 2,344,990

BATHTUB STRUCTURE

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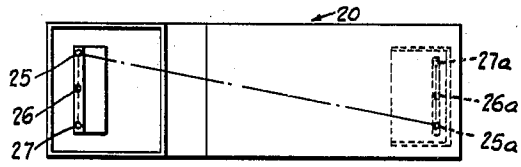


FIG. 2.

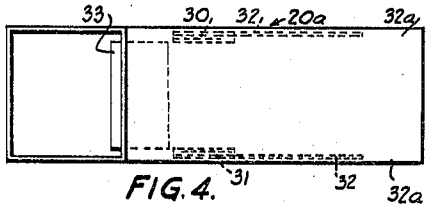


FIG. 4.

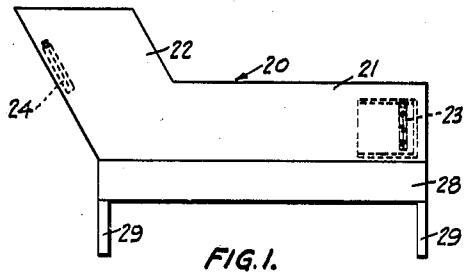


FIG. 1.

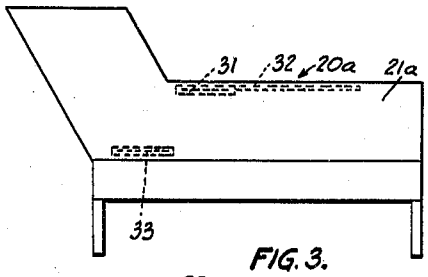


FIG. 3.

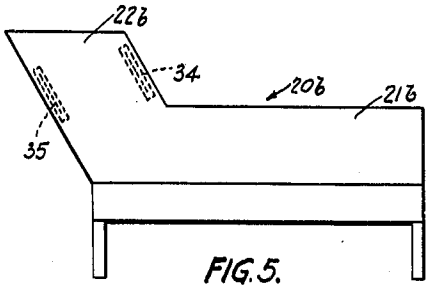


FIG. 5.

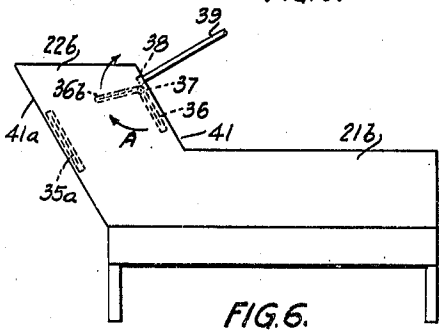


FIG. 6.

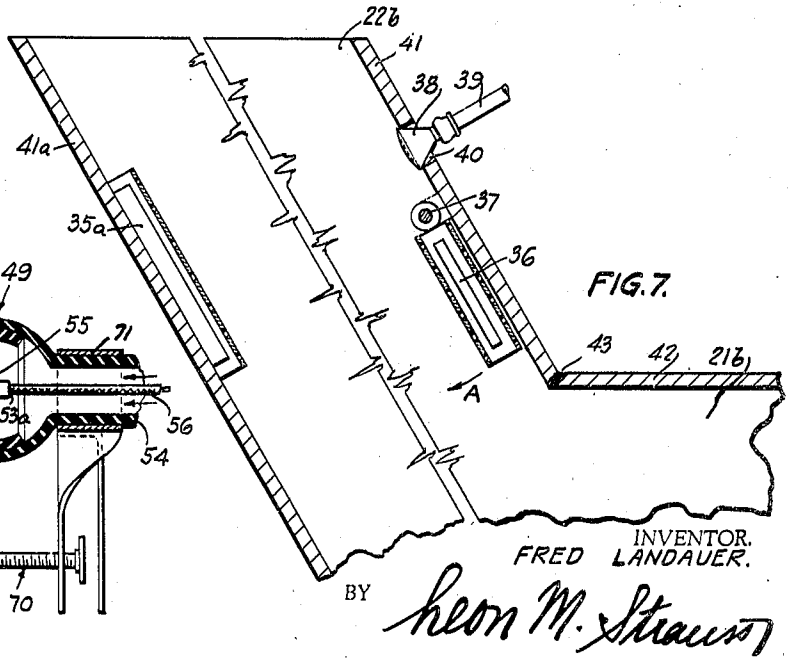


FIG. 7.

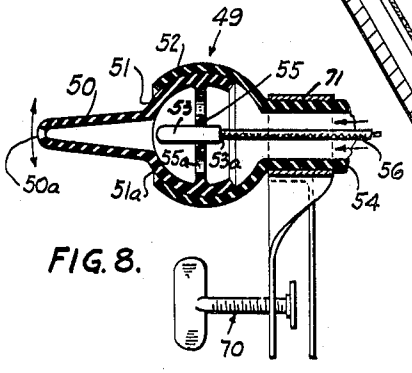


FIG. 8.

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BATHTUB STRUCTURE

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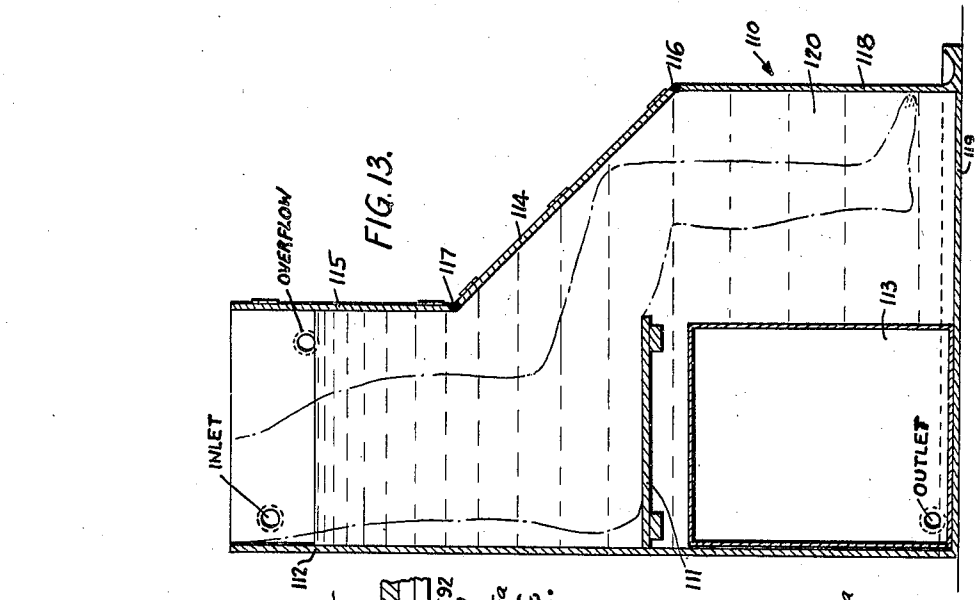


FIG. 13.

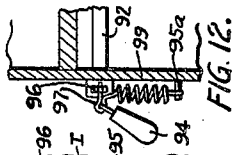


FIG. 12.

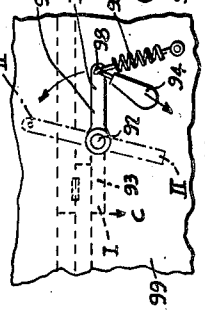


FIG. 11.

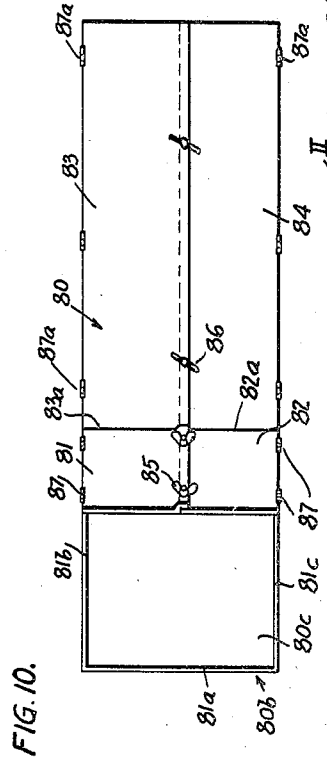


FIG. 10.

FIG. 9.

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2,344,990

BATHTUB STRUCTURE

Fred Landauer, New York, N. Y.

Application May 2, 1941, Serial No. 391,491

2 Claims. (Cl. 128—369)

This invention relates to medical baths, such as electro-therapeutic baths, and more particularly to improvements in or relating to bath tub structures or similar vessels for facilitating a uniform administration of such electric baths to persons suffering from certain ailments.

In its broadest aspect this invention tends to avoid the disadvantages resulting from the conventional form and shape of the bath tub requiring a relatively high water level in the tub when it becomes necessary to cover chest or other upper parts of the human body to be subjected for treatment in such therapeutic baths. Consequently, a relatively large quantity of water and high water level will be apparent above the legs of the bather if the water also reaches and covers, for instance, his chest.

It is, therefore, an object of the present invention to provide bath tub structures which are so shaped that when the body is reclining in the bath tub, the column of water in that portion of the tub receiving the chest or other upper parts of the body will be higher than the water column contained in that portion of the tub receiving the thigh and leg parts of the bather.

It is another object of the present invention to provide a substantially L-shaped bath tub structure, the horizontally extending portion of which being preferably closed by removable closure means.

It is a still further object of the present invention to provide electrode means either fixed or displaceable relatively to one another at predetermined locations within such new bath tub structures.

Yet, another object of the present invention resides in the provision of slideably arranged or swingably disposed electrode means within such bath tub, the electrode means being made to approach each other selectively and with respect to the body part to be treated.

A still further object of the present invention is to provide means to very rapidly discharge the water or any other bath liquid used in connection with such therapeutic baths, from the bath tub proper into an auxiliary container or the like in order to free the bather from the bath liquid after termination of the hydro-electric treatment permitting the patient to withdraw from the bath tub without waiting until the tub is empied in the customary manner.

Still another object of the present invention is to provide adjustable means preferably connected with the legs of the bath tub structure whereby to change the positioning of the bath tub and the level of the water contained therein with respect to the bather reclined therein.

A still further object of the present invention is to provide removable water inlet or shower head means which can be clamped to a wall of the bath tub or inserted in predetermined openings of the bath tub wall, the aforesaid electrode means being displaceably arranged with respect to said inlet means.

Yet another object of the present invention is to provide electrode means which have a plurality of terminals for connection with the electric current source, in order to selectively increase or decrease the length of electric current bath in the bath liquid.

With the foregoing and other objects in view, the invention resides further in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiments of the invention herein disclosed may be made within the scope of the claims without departing from the spirit of this invention.

Some practical embodiments of the invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a diagrammatic side view of a bath tub made in accordance with the invention and containing two electrodes.

Fig. 2 is a top plan view of the bath tub shown in Fig. 1.

Fig. 3 is a diagrammatic side view of a bath tub embodying the invention and provided with two electrodes, one slideable with respect to the other.

Fig. 4 is a top plan view of the tub illustrated in Fig. 3.

Fig. 5 is a diagrammatic side view of the bath tub of Fig. 1 but showing the electrodes in different positions.

Fig. 6 is a diagrammatic side view of a bath tub structure according to the invention and showing one of the electrodes swingable with respect to the other.

Fig. 7 is a partial sectional view on an enlarged scale of the swingable electrode portion in a bath structure shown in Fig. 6.

Fig. 8 is an enlarged sectional view of a swivel spray nozzle or shower head including electrode means and clamp arrangement.

Fig. 9 is a sectional side view of a modified bath tub made in accordance with the invention.

Fig. 10 is a top plan view of the tub structure shown in Fig. 9.

Fig. 11 is an enlarged detail view of the trap for the water tank cover.

Fig. 12 is a side view of the detail shown in Fig. 11.

Fig. 13 is a bath structure in which the human body may be disposed in sitting position.

Referring now more particularly to the drawings, it is disclosed in Figs. 1 and 2 one form of bath tub structure **20** made in accordance with he invention. As seen in the drawing, the bath tub proper is substantially L-shaped, the horizontal portion **21** thereof being adapted to receive the thighs and the legs of the bather (not shown), while the substantially slanting or inclined portion **22** upwardly extending from portion **21** of the bath tub structure is adapted to contain the chest and upper parts of the bather's body. Portions **21** and **22** are respectively provided with electrodes **23, 24**, the structure of said electrodes being preferably the same or similar to that disclosed in co-pending patent application Serial Number 380,940, filed February 27, 1941. Electrode **24** is so disposed in tub portion **22** as to be employed as a back rest for the bather, whereas electrode **23** is arranged in tub portion **21** for contact with the bather's feet. Electrodes **23, 24** are preferably provided with a plurality of terminals **25, 26, 27** and **25***a*, **26***a*, **27***a*, respectively, for obtaining different lengths of path of electric current through the water when contained in the bath tub **20**. To this end, terminals **25** and **25***a*, for instance, may be connected to a source of electric current (not shown) and a cross-wise path of electric current in the water will thus be established as indicated in dot-dash lines (Fig. 2). It will be apparent that a current between **26** and **26***a* through the water will pass a shorter path through the water between said terminals.

A container or tank **28** located underneath the tub portion **21** is connected with the latter in a manner and for a purpose which will be explained further below and with reference to Fig. 9. Bath tub **20** together with container **28** are supported by four legs **29** which may be of similar structure as that shown and described with respect to Fig. 9.

In Figs. 3 and 4 bath tub structure **20***a* is shown which is similar to that disclosed in Figs. 1 and 2. However, the electrodes are located and disposed within the tub in a different manner. Electrodes **30** and **31** are slidably arranged on rods **32**, disposed at the upper part of the side walls **32***a* of the tub portion **21***a*, and the electrode **33** is so disposed and positioned in the bath tub **20***a* that it may serve as a seat for the bather when reclined in the bath tub. Electrodes **30** and **31** may be connected to one terminal of an electric current supply source whereas electrode **33** may be joined to the other terminal of said source (not shown). It will be apparent that different lengths of current path through the water contained in the bath tub, may be obtained if the electrodes **30** and **31** are displaced or slid along rods **32** relativeiy to each other and/or to electrode **33** which may be fixed in its position. In Fig. 5 the bath tub structure **20***b* contains the electrodes **34, 35** in the inclined and upwardly extending tub portion **22***b*, no electrodes being contained in tub portion **21***b*. It is obvious that in the latter instance when electric current flows between electrodes **34, 35** the current will pass the chest of the bather when reclined in tub **20***b*.

Fig. 6 shows the same structure and disposition of the electrodes as disclosed in Fig. 5. While electrode **35***a* is fixedly connected in upwardly extending tub portion **22***b* at wall **41***a*, electrode **36** is made swingable about pivot **37** connected to wall **41** of tub portion **22***b*. Wall **41** has an opening **40** through which passes water inlet or shower head **38** of known construction which is connected to a hose **39**. Shower head **38** may be employed as the water inlet for the tub as well as in connection with electrode **36** in a manner as disclosed in U. S. Patent Number 2,240,504. Electrode **36** may be displaced or swung (for instance to position **36***b* in the direction of arrow A) relatively to the water inlet **38** as well as to fixed electrode **35***a*, whereby the direction of the electric current conducted through the water stream emitted from the shower head **38** may be varied in a wide range.

Fig. 7 shows in somewhat greater detail construction and positioning of the electrodes and that of the shower head in tub portion **22***b*. As it is apparent from Fig. 7, closure wall **42** covering the horizontally extending tub portion **21***b* has interposed between it and wall **41** sealing means **43** made of rubber or like material whereby a water-tight joint between said walls is achieved.

Instead of a shower head **38** as shown in Fig. 7, a nozzle construction **49** as disclosed in Fig. 8 may be employed. This nozzle construction **49** is preferably removably attachable in any position on one of the walls of the tub (not shown) by means of a clamping mechanism **70** in any conventional manner.

The nozzle construction **49** is comprised of the nozzle proper **50** which has the opening **50***a* at its forward end. Nozzle **50** may be swivelled with its curved walls **51, 51***a* within shell **52**, the latter being connected to tube or hose **54**. Between curved walls **51** and **51***a* extends perforated partition **55** having apertures **55***a*. Partition **55** centrally supports electrode **53**, terminal **53***a* of which being connected through wire **56** which extends through tube **54**, to an electric current supply source (not shown). As it can be easily realized from the drawings, water may be supplied through tube **54** and perforated partition past electrode **53** into nozzle **50**. Electric current may thus be conducted by the water jet emitted from opening **50***a* between said electrode **53** and another electrode of opposite polarity, for instance, such as **35***a* positioned within the bath tub. Thus, it will be possible to direct an electrically charged water jet from nozzle **50** to any particular part of the human body in contact with an electrode of opposite polarity. As it is obvious from the drawings, the nozzle construction is carried and supported by sleeve **71** of the clamping mechanism **70**.

It is, of course, understood that the electrode structures diagrammatically shown in the drawings, may be of a type as disclosed in co-pending patent application Serial No. 380,940 above referred to.

Fig. 9 is a sectional side view of a bath tub vessel in a modified form, showing tub **80** with its elongated, horizontally directed portion **80***a* and its slanting portion **80***b* upwardly extending from the latter. Tub portion **80***b* has the top opening **80***c* formed by rear wall **81***a* and side walls **81***b* and **81***c*. The front wall of tub portion **80***b* is removable and consists of sections **81, 82** which are preferably provided with removable hinge means **87** the latter connecting the front wall sections **81, 82**, with side walls **81***b* and **81***c* which are provided with any known means (not shown) to make this connection water-tight.

Sections 81 and 82 overlap each other at their abutting ends and may be made impervious to water and tightened thereat by wing screws 85, as shown in Fig. 10. In order to close the open top of tub portion 80*a* when the latter is in use, top wall sections 83, 84 are provided, which may be of similar construction as front wall sections 81, 82 and which have hinge connections 87*a* and wing screws 86 for a purpose hereinabove described in connection with sections 81, 82. Sections 81 and 83 and sections 82 and 84 are provided at their abutting ends 83*a* and 82*a* with any known sealing means, for instance, in the form of rubber strips or the like 88 (Fig. 9) so that the aforesaid front and top wall sections may be brought in water-tight connection with each other and also with the side walls of the tub structure 80.

Bottom wall 81*d* of tub portion 80*a* possesses a relatively large opening 81*e* which connects said portion 80*a* with tank 100 positioned therebelow. Above opening 81*e* is fixed a preferably perforated seat 89 which may contain an electrode (not shown) of an insulated type, as disclosed in copending patent application Serial No. 380,940, above referred to. Normally, opening 81*e* is closed from below by liquid discharge means or flap 90 which is swingable about a pivot 91 fixed to the underface of bottom wall 81*d*, as seen in Fig. 9.

The free end of flap 90 is supported and tightly pressed against said underface by means of spring-actuated lever 93 which is rotatable about bolt 92. Bolt 92 protrudes through side wall 99 of tank 100 and carries a spring-lever arrangement 95, 96 positioned on the outer face of said tank side wall 99 (Figs. 11 and 12). Spring 95 is fixed with one of its ends to a stud 95*a* fixed to said side wall 99, whereas the other end 97 of said spring is insertable into loop or opening 98 of lever 96. A handle 94 is connected to the end 97 of spring 95 for a purpose hereinafter described.

As aforesaid, flap 90 closes up (through lever-spring arrangement 95, 96) opening 81*e* of the bath tub 80 so that when the latter is filled with water, no water can escape from tub portions 80*a* and 80*b*. The tub structure may contain at any desired positions therein electrodes, such as diagrammatically illustrated in Figs. 1 to 7. As seen in Fig. 9 (when sections 81, 82 and 83, 84 are in water-tight engagement with tub 80), the water rises from tub portion 80*a* into tub portion 80*b* and provides in the latter a higher level than in tub portion 80*a*, as this portion 80*a* is entirely closed and communicates with tub portion 80*b*. After an electro-therapeutic bath has been administered to the bather who reclines in bath tub 80, it will be desirable to very rapidly empty said tub 80 in order to free the bather from the bath liquid after termination of his treatment, and to permit him to withdraw from the bath tub without waiting until the tub is emptied in a customary manner. To this end, either the bather or an operator may pull handle 94 in order to release spring 95 from its connection with lever 96 whereby lever 93 will be moved in the direction of arrow C (from position I to position II) whereby said liquid discharge means or flap 90 will be released from holding lever 93, thus allowing the water from tub 80 to instantly escape through opening 81*e* into tank 100. From tank 100 the water may then be more slowly discharged through a preferably flexible hose 103 which may be controlled by valve 104. As seen in Fig. 9, a similar hose and valve construction 101, 102 is provided in bottom wall 81*d* of said tub 80 for facilitating a slow discharge of water from said tub 80.

In order to modify the positioning of the bather in tub 80 and to thereby regulate the water level in tub portions 80*a* and 80*b* respectively, the legs 100*a* which support container 100 and tub 80, may be made adjustable in height and inclination. Any known regulating means, such as rack and pinion drive, indicated by numeral 105, and ball joint indicated by numeral 106 may be employed for this purpose.

From the above, it can be realized that it is thus made possible to vary and regulate in tub portions 80*a* and 80*b* the water column through which an electric current may be transferred to the bather and further the water level in each of said tub portions.

Fig. 13 shows a sectional side view of a modified tub structure 110 in which the human body may be disposed in sitting position on a seat 111 fixed within said tub or vessel 110 at rear wall 112. Below seat 111 is arranged a tank 113 for a purpose similar to that described in connection with tank 100 (Figs. 9, 11 and 12). Tub structure 110 can be employed as a foot bath as well as a full bath with the bather in sedantary position. To this end, front wall sections 114, 115 can be either removed or tightly connected with one another and with the side walls of the tub 110, sealing strip means 116, 117 of rubber or similar material being interposed for this purpose. Sections 114, 115 may be hinged to the side walls of tub 110 in the same or similar manner, as disclosed with reference to sections 81, 82 and 83, 84 of Fig. 10. Section 118 is fixedly connected to bottom 119 and to side walls of the tub or vessel structure 110 so that upon removal of the front wall sections 114, 115 from section 118 and the side walls, the lower portion 120 of the vessel 110 may be used as a foot bath. It is well understood, that electrodes may be placed in said bath structure 110 in any desired positions, according to its use as a foot bath or as a full body bath.

It is well understood that the walls of the tub may be made of an electric insulating material or may have one or more layers of such material. The nozzle above referred to may be made of rubber or rubber composition or like insulating material.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to the above embodiments, it will be understood that various admissions and substitutions and changes in the form and details of the apparatus illustrated and its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. An apparatus for electro-therapeutic or similar treatments comprising a bath vessel provided with an upwardly extending portion for receiving the upper parts, such as the chest of the bather, and provided with a portion angularly disposed with respect to said first-mentioned portion and adapted to receive the thighs and legs of the bather, a seat provided in said vessel, a tank located substantially below said vessel and connected to the latter to form a unit therewith, liquid discharge means positioned between said tank and said vessel and arranged to open up into said tank, and lever means including a handle,

said handle being disposed outside of said vessel, said lever means being operatively connected with said liquid discharge means, whereby upon manipulation of said handle, said lever means may release the discharge means to open the same up into said tank thereby rapidly discharging liquid from said vessel.

2. An apparatus according to claim 1, including supporting means for said unit, and adjustable means associated with said supporting means for varying the position of said unit relatively to said supporting means.

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