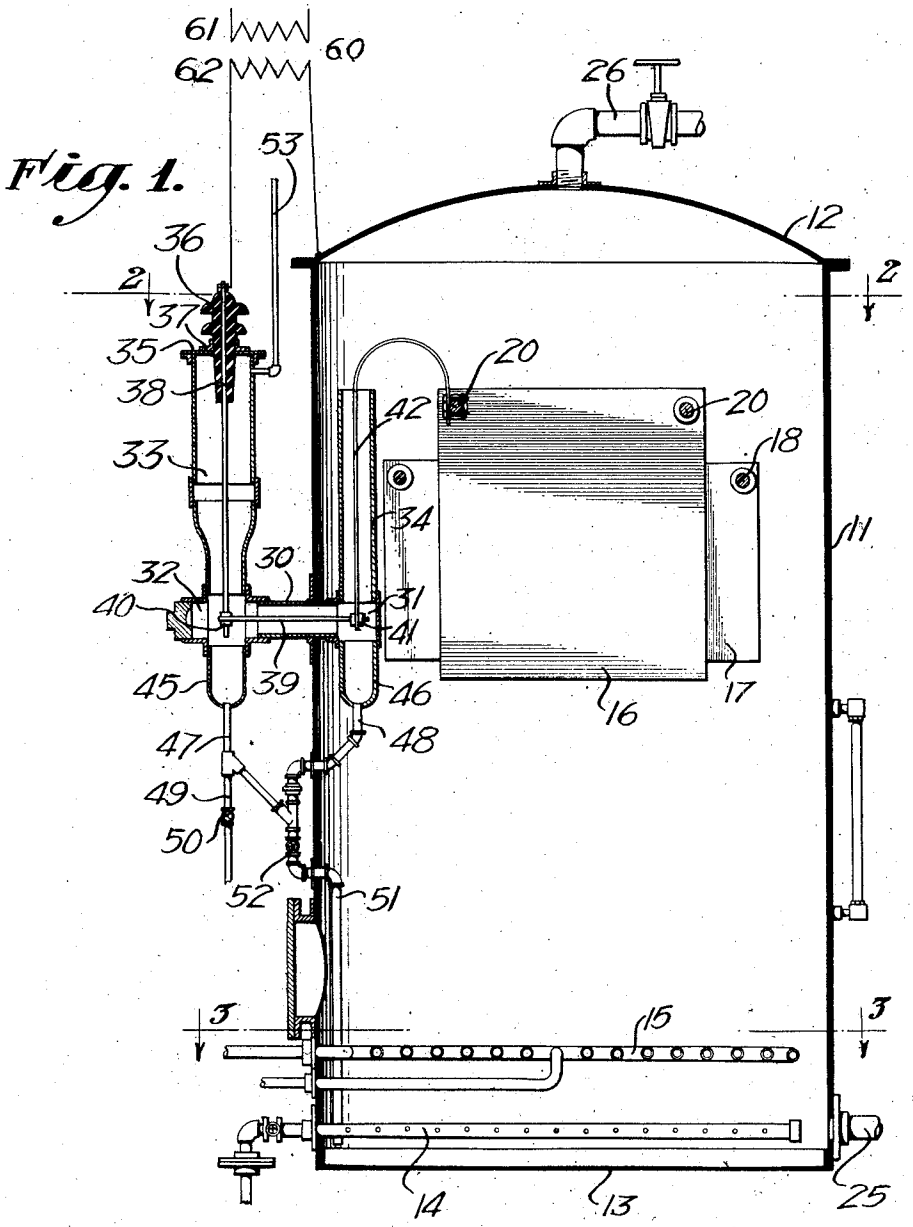
Sept. 4, 1923. 1,467,003

R. E. LAND

ELECTRICAL DEHYDRATOR

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Fig. 1.



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Sept. 4, 1923. 1,467,003

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Fig. 2.

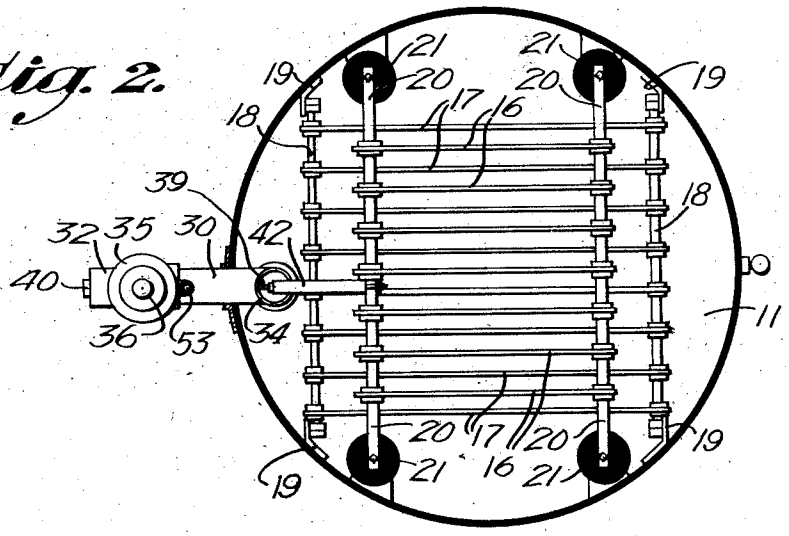
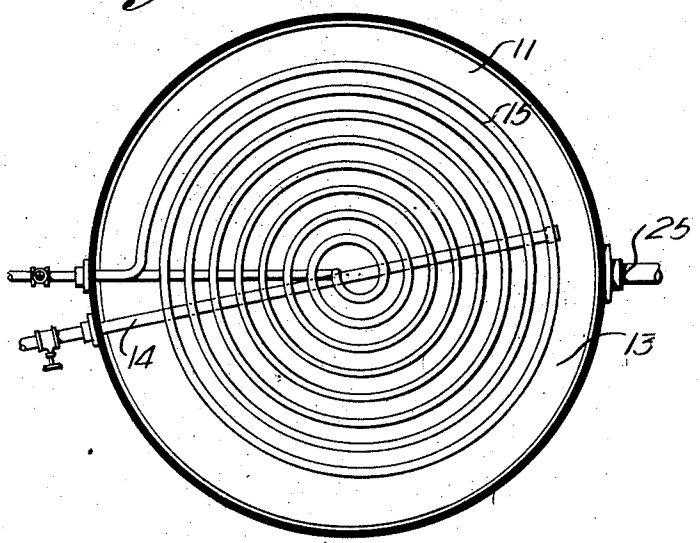


Fig. 3.



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Patented Sept. 4, 1923. 1,467,003

UNITED STATES PATENT OFFICE.

RECTOR E. LAND, OF HOUSTON, TEXAS, ASSIGNOR TO PETROLEUM RECTIFYING CO., A CORPORATION OF CALIFORNIA.

ELECTRICAL DEHYDRATOR.

Application filed September 28, 1922. Serial No. 591,084.

To all whom it may concern:

Be it known that I, RECTOR E. LAND, a citizen of the United States, residing at Houston, in the county of Harris, State of Texas, have invented a new and useful Improvement in Electrical Dehydrators, of which the following is a specification.

My invention relates to the art of dehydrating oil by the use of electric current. In this art, the oil is passed into an enclosed tank in which electrodes are suspended.

It is common practice to ground one set of electrodes, hereinafter called the grounded electrodes, to the tank, the other electrodes, hereinafter called live electrodes, being connected to a source of electrical power. Since it is desirable that the tank be entirely enclosed, it is necessary to bring the conductor to the live electrode through the wall of the tank and it is further necessary to insulate it from this wall in its passage therethrough.

It is an object of my invention to provide a novel form of construction for bringing the live conductor through the wall of the tank.

It is common practice at the present time to use for this purpose what is known as a wall bushing which consists of a porcelain or composition material insulator having an electric conductor passing through the center thereof. The emulsion to be treated contains a considerable amount of water and other foreign substances and these substances have a tendency to collect upon the surface of the wall bushing inside the tank forming conducting paths which sometimes break down the insulation and, in some cases, destroy the insulator.

It is an object of my invention to provide a structure using a wall bushing in which the wall bushing is placed in a pocket which may be filled with clean oil at the start of the test and in which any other oil tends to clean itself due to the dehydrating action of the live parts.

Further objects and advantages will be made evident hereinafter.

Referring to the drawings which are for illustrative purposes only.

Fig. 1 is a side elevation, partly in section, of a dehydrator to which my invention has been applied.

Fig. 2 is a section on a plane represented by the line 2—2 of Fig. 1, and,

Fig. 3 is section on a plane represented by the line 3—3 of Fig. 1.

In the form of the invention shown, a tight tank 11 is provided, this tank having a top 12 and a bottom 13. The emulsion to be treated is supplied through a perforated pipe 14, the emulsion rising through the tank where it is heated by a steam coil 15 passing upwardly between live electrodes 16 and grounded electrodes 17. The grounded electrodes 17 consist of sheet metal plates carried on pipes 18 which are carried upon supports 19 rigidly secured to the tank 11. The live electrodes 16 are carried on pipes 20 which are supported on insulators 21, best seen in Fig. 2, the plates 16 being therefore insulated from the tank. The emulsion in passing between the electrodes 16 and 17 is dehydrated, the water falling into the bottom of the tank from which it may be withdrawn through a pipe 25 and the cleaned oil rising to the top of the tank from which it may be withdrawn through a pipe 26.

Current is supplied to the live electrodes 16 by means of a construction, best shown in Fig. 1. This consists of a nipple 30 which is welded to the side of the tank 11 and which terminates in an inner T 31 and an outer cross 32. Secured to the upper limb of the cross 32 is a pipe 33 and secured to the upper limb of the T 31 is a pipe 34. The pipe 34 is open at its upper end. The pipe 33 has its upper end closed by a plate 35 on which a wall bushing 36 is secured by means of a flange 37. The wall bushing 36 is formed of insulating material and has a conducting rod 38 which passes downwardly therethrough. This rod is secured by means of nuts 40 to a second rod 39 which passes through the nipple 30 and is in turn secured by means of nuts 41 to a flat strip 42 which connects to one of the pipes 20 supporting the live electrode 16.

Secured to the lower end of the cross 32 is a drain pocket 45, a similar drain pocket 46 being secured in the lower end of the T 31. These drain pockets are connected together by means of pipe 47 and 48 and are connected by means of a pipe 49 and a valve

50 with a drain, and by means of a pipe 51 and a valve 52 with the bottom of the tank. A vent pipe 53 is provided in the top of the pipe 33 to prevent air pockets from forming thereon.

The high tension current required for dehydration is supplied by means of a transformer 60 having a low tension primary 61 and a high tension secondary 62, an electric potential say of 11000 volts, being produced in the secondary 62. One side of the secondary is connected to the tank 11. The result is that a potential of 11000 volts is impressed between the conductors 38, 39 and 42 and the tank structure including the members 30 to 34, and thus between the plates 16 and 17.

In starting the dehydration, the inverted U-shaped channel formed by the members 30 to 34 may be filled with transformer oil or other oil having a high dielectric capacity. This high dielectric oil provides adequate insulation around the conductors 38, 39 and 42 and prevents the insulator 36 from becoming injured due to foreign matter carried in the emulsion being dehydrated. After the tank is filled, the upper portion of the tank is continuously filled with dehydrated oil which has in itself a dielectric value. As a result, the contents of the U-shaped chamber, even if there is some mixture between the oil intially placed therein and the dehydrated oil in the top of the tank, is still of high dielectric value and no fouling of the insulator 36 occurs. In the event that any water collects in any portion of the U-shaped channel, it naturally gravitates into the bottom of the chambers 45 and 46, being delivered by the pipes 47 and 48 through the valve 50 into a drain or through the valve 52 into the bottom of the tank from which it may be readily withdrawn through the pipe 25.

I claim as my invention:

1. A device for conducting an electrical current through the wall of an oil filled tank, comprising: walls forming a channel communicating at one end with said tank; an insulating bushing closing the other end of said channel; and an electrical conductor passing through said bushing and said channel into said tank.

2. A device as in claim 1 in which said channel consists of limbs which are not coaxial.

3. A device as in claim 1 in which said channel is substantially U-shaped.

4. A device as in claim 3 in which the lower central portion of said U-shaped channel is provided with a water outlet pipe.

5. A device as in claim 4 in which the water outlet pipe discharges into the bottom of the tank but is provided with a valve which may be used to prevent circulation through said water outlet pipe.

6. A device as in claim 3 in which one arm of the U-shaped channel is inside the tank and the other arm is outside the tank.

In testimony whereof, I have hereunto set my hand at Houston, Texas, this 16th day of Sept. 1922.

RECTOR E. LAND.