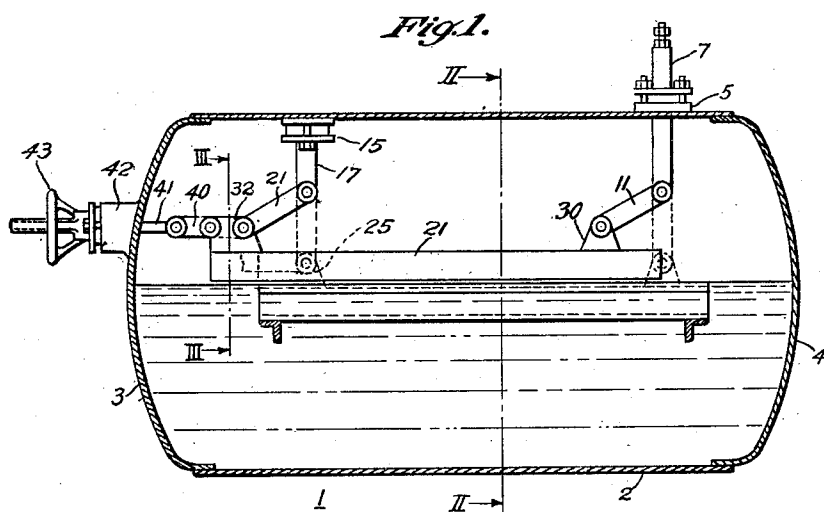
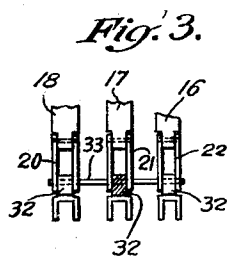
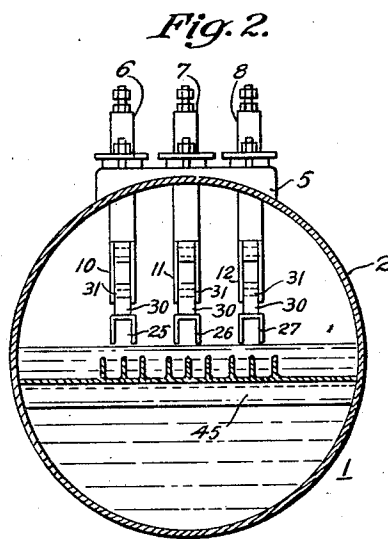


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ELECTRIC STEAM BOILER

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ELECTRIC STEAM BOILER.

Application filed March 4, 1927, Serial No. 172,751, and in Germany March 4, 1926.

My invention relates to electric steam boilers and more particularly to that type of boiler wherein electrodes are immersed in the fluid to be vaporized.

5 An object of my invention is the provision of an improved and convenient means for adjusting the relative positions of electrodes in an electric steam boiler.

10 Another object of my invention is the provision of an improved means for conducting electric current to the electrodes in a boiler.

In practicing my invention, I provide, in a steam boiler, a plurality of horizontally-disposed electrode plates pivotally suspended 15 from the top of the boiler. The arrangement is such that the electrode plates may be moved vertically but are maintained in a horizontal plane. The vertical movement of the electrode plates is controlled by a rod connected thereto and extending through an 20 end wall of the boiler.

To adapt the device for use at a relatively low voltage, a stationary electrode is mounted in the boiler beneath the movable 25 electrodes which, in effect, shortens the path of the electric current through the liquid.

In the drawings;

Figure 1 is a longitudinal sectional view of a boiler embodying my invention.

30 Fig. 2 is a transverse sectional view on line II—II of Fig. 1, and

Fig. 3 is a detail view partly in section on the line III—III of Fig. 1.

In the device disclosed in the drawings, 1 35 designates generally a steam-boiler casing comprising a cylindrical shell 2 having curved ends 3 and 4. Upon the cylindrical portion 2, adjacent to one end thereof, is mounted a terminal block 5 carrying a plurality of terminals 6, 7 and 8, suitable insulation being provided to insulate them from 40 each other and from the shell 2. The terminal members 6, 7 and 8 extend down through the casing and, upon the lower ends thereof pairs of links 10, 11 and 12, respectively, are pivoted to swing in vertical 45 planes parallel to the major axis of the boiler.

50 Within the casing and mounted upon the shell 2 is a suspension means comprising an insulating block 15 and depending portions 16, 17 and 18, rigidly secured thereto. Pairs

of links 20, 21 and 22 are respectively pivoted to the lower ends thereof to swing in the same planes as those of links 10, 11 55 and 12.

Three electrode plates 25, 26 and 27, of substantially channel-shape in cross section, are positioned within the boiler parallel to the longitudinal axis thereof in a horizontal 60 plane, and in spaced lateral relation to each other. Upon each of these plates are two lugs 30 and 32 adjacent the ends thereof and having transverse apertures therein. Pins 31 extend through the lower ends of links 65 10, 11 and 12 and through the apertures in lugs 30 to form a pivoted connection between said links and lugs. Upon the opposite ends of plates 25, 26 and 27 are lugs 32 apertured laterally thereof and pivotally secured 70 to the lower ends of links 20, 21 and 22 by means of a single rod 33 of insulating material.

The lug 32 on electrode plate 26 is elongated and has pivoted to it an additional 75 link 40, the opposite end of which is pivoted to a rod 41 which extends through the end wall 3 and a stuffing box 42. The extremity of rod 41 is screw-threaded to co-operate with a screw-threaded hand wheel 43. 80

To adapt the heater for operation with a relatively low voltage, a horizontally extending plate 45 is mounted within the boiler beneath the contact plates 20, 21 and 22. The upper face of the electrode 45 85 is of substantially comb-shape in lateral section, the upstanding portions of which extend parallel with the depending edges of the channel-shape electrodes 25, 26 and 27.

In operation, the electrodes 6, 7, and 8 90 are connected to a suitable source of power, the current being conducted to the movable electrodes through the suspension links 10, 11 and 12. Normally, if a relatively high voltage is used, there will be no necessity for 95 the stationary electrode 45 and the current path will be through the liquid between the electrodes. If, however, a low voltage is impressed upon the electrodes, it is necessary to shorten the current path through the liquid, and, therefore, the stationary electrode 45 is employed. In the latter event, the current passes from a movable electrode 100 through the liquid to electrode 45, then back

through the liquid to another movable electrode.

To vary the depth of immersion of the movable electrodes, and hence, the output of the boiler, the hand wheel 43 may be turned in the appropriate direction to force rod 31 into, or out of, the boiler. This would normally result in a longitudinal movement of the electrode 21 only, but because of rod 33 extending through all three electrodes, they move in unison, and, because of the link suspension at both ends of the electrodes, they will be maintained horizontal during their vertical movement.

It will be noted that, by my invention, I have provided a convenient and effective means for regulating the vertical position of the movable electrodes, and, since the electric current is conducted to these electrodes through a portion of the suspension means, the necessity for cumbersome and expensive electrical connections within the boiler is obviated.

While I have shown and described a particular embodiment of my invention, changes may be effected therein without departing from the spirit and scope thereof as set forth in the appended claims.

I claim as my invention:

1. In an electric steam boiler, a plurality of electrodes within said boiler, means for pivotally suspending said electrodes from the top of said boiler, means extending

through an end wall of said boiler for effecting vertical movement of said electrodes, and means, including said pivoted suspending means for conducting electric current to said electrodes.

2. In an electric steam boiler, a plurality of horizontally extending electrode plates within said boiler, pivoted means for supporting said electrodes to permit a vertical movement thereof and to maintain said electrodes horizontal during said movement, and means extending through a wall of said boiler for effecting said vertical movement.

3. In an electric steam boiler, the combination with a horizontally extending stationary electrode plate, of a plurality of horizontally extending, laterally spaced, electrode plates, means pivotally suspending said latter electrodes from the top of said boiler to permit vertical movement thereof with respect to said stationary electrode and to maintain said electrodes horizontal, means for effecting vertical movement of said electrodes controlled from without said boiler, and means for conducting current to said pivotally suspended electrodes including certain of said pivoted suspending means.

In testimony whereof, I have hereunto subscribed my name this 18th day of February, 1927.

STEPHAN SCHNEIDER.