Nov. 9, 1937. B. HANSSON 2,098,746

ARRANGEMENT IN CONDENSERS

Filed March 20, 1936 2 Sheets-Sheet 1

Fig.4

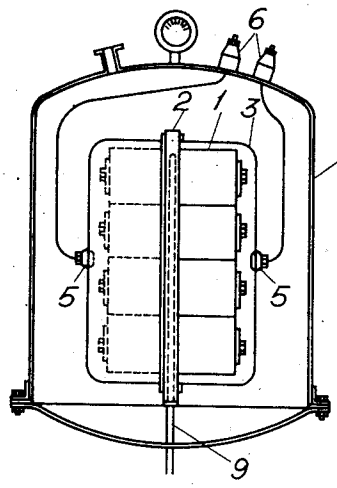


Fig.5

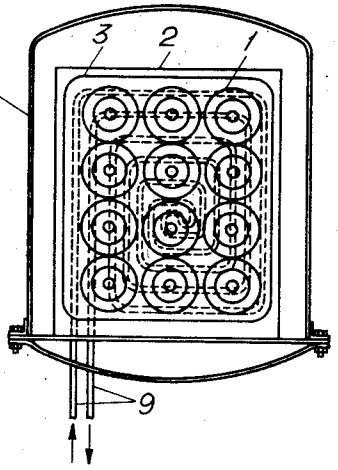


Fig. 1

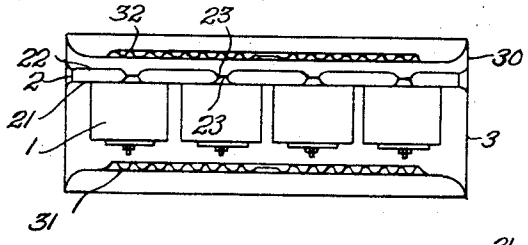
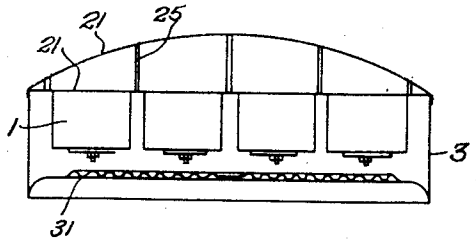


Fig. 2



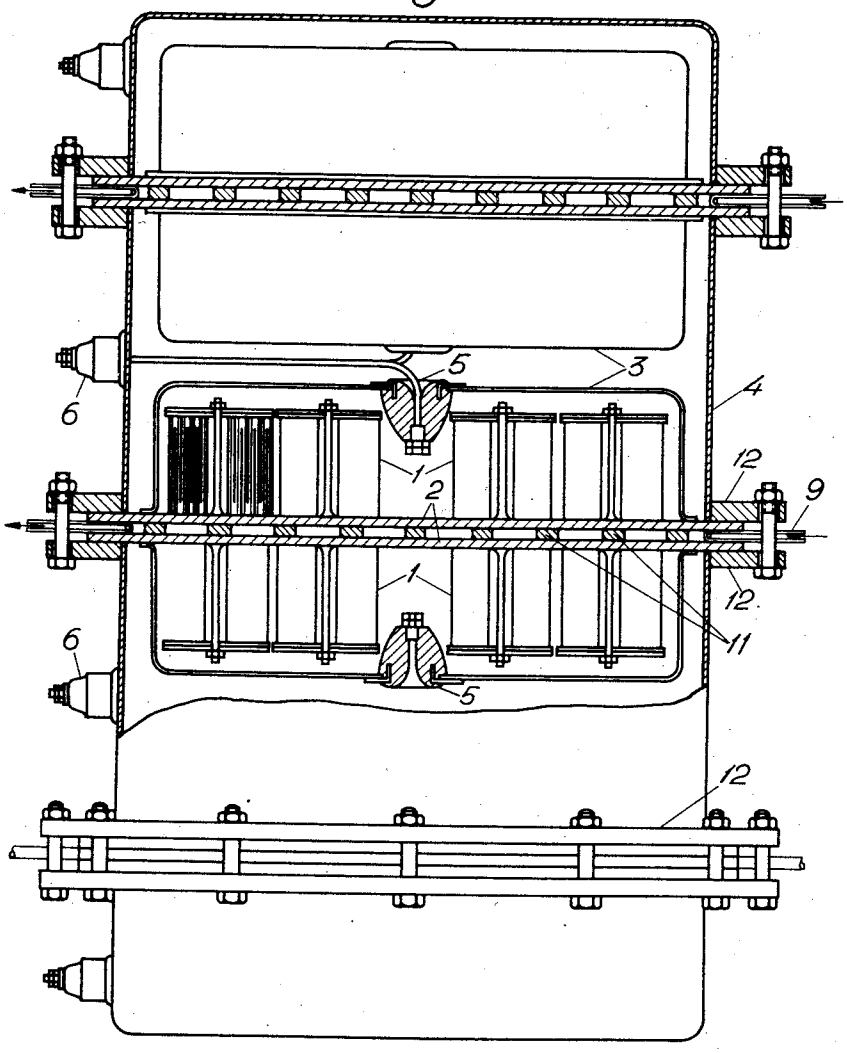
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ARRANGEMENT IN CONDENSERS

Filed March 20, 1936 2 Sheets-Sheet 2

Fig. 3



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UNITED STATES PATENT OFFICE

2,098,746

ARRANGEMENT IN CONDENSERS

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Application March 20, 1936, Serial No. 69,779
In Sweden September 2, 1935

5 Claims. (Cl. 175—41)

The present invention relates to condensers of the type consisting of metal foil electrodes wound spirally to a roll with an intermediary insulating layer. In such condensers the roll is as a rule inserted in a tank containing an insulating medium, generally oil, and the heat losses of the condenser are conducted to the surrounding atmosphere through the oil and the walls of the tank. The oil in the tank is often put under pressure, higher than that of the surrounding air, so that the insulating strength is increased considerably more than the heat dissipation quality of the oil. As the load capacity of the condenser depends to a high degree upon the heat dissipating quality, a very effective cooling is, therefore, of paramount importance.

A more effective conducting of the heat losses from the interior of the condenser is effected when one electrode of the condenser makes direct metallic contact with a wall in the tank enclosing the condenser. When the tank is filled with a medium under pressure the wall making contact with the foils must never yield under the pressure to which it is subjected as this would greatly lessen the cooling action. This refers especially to tanks with plane walls as most commonly used for condensers.

The present invention has for its object the provision of means whereby the cooling wall with the condenser foils pressed against it remains in its original plane condition in spite of the interior pressure acting upon it in the tank.

In the accompanying drawings which illustrate the invention, by way of example, in different forms:—

Fig. 1 is a cross-section of one form of the condenser;

Fig. 2 is a similar view of another form;

Fig. 3 is an enlarged view partly in section of a third form; and

Figs. 4 and 5 are sectional views taken at right angles to each other and showing still another form of the condenser made in accordance with this invention.

In the form shown at Fig. 1, the condenser rolls 1 are inserted into a cylindrical tank 3 with a circular, flexible bottom wall 31 and a circular cooling wall 2 against which the foils protruding at the ends of the condenser rolls 1 are pressed. The tank 3 is filled with oil under pressure and the flexible wall 31 is corrugated in order to better withstand the stresses due to the internal pressure. Another tank 30 having a flexible wall 32 similar to the former one 31 but enclosing no condenser elements is placed on the other side of the cooling wall 2. The two tanks communicate with each other, so that the pressure is the same on both sides of the wall 2.

The cooling wall 2 consists of two metal sheets 21, 22 with spacing pieces conveniently consisting of warts or beads 23 stamped into the sheets and other impressions, if required, for stiffening the sheets. The warts of the two sheets are turned against each other and welded or soldered or joined to each other by other means. A firm double wall is thus formed and inside of it a cooling fluid, such as water, may circulate.

The cooling wall 2 is placed horizontally with the condenser elements underneath the same so that the heat from the condenser elements is transmitted to the surrounding fluid and rising upwards with same may be collected at the cooling wall 2 and led away from the same by the cooling medium.

In Figure 2 one metal sheet 21 is plane and the other 22 is cupola shaped and cooling fluid is circulated between them. The double wall formed by the sheets is stiffened by means of distance pieces 25, which also serve as cooling flanges.

The above figures show the condenser rolls placed on one side only of the cooling wall and Figs. 3 to 5 show the condenser rolls placed on both sides of the cooling wall.

In the form shown at Fig. 3, the protruding foils of the condenser rolls 1 are pressed against a metal plate 2 forming a wall in the tank 3 enclosing the condenser rolls. The plate 2 forms a flange round the tank. In this form six condenser tanks 3 are connected together two-and-two, with the plate walls 2 turned towards each other but separated by means of intermediary pieces 11 and being bolted together by means of the flanges of the plate walls and flanges 12 on an outer tank 4, made in four sections. When assembled the condenser tanks 3 are suspended inside the tank 4 between the flanges 12. The inner tanks 3 and also the outer tank 4 are filled with a medium (liquid or gas) under pressure; and the adjacent tanks 3 which are bolted together communicate with each other for example by means of a hole in the plate walls 2. The pressure on both sides of the double wall 2 is thus the same and the wall remains in its original plane condition. The spacing pieces 11 holding the plate walls 2 apart from each other are arranged in such a way that channels are formed between the walls and in these channels a cooling medium is circulating. The supply pipe of the circulating medium is shown at 9.

As one electrode is in direct metallic contact with the tank 3 and as this is connected to the tank 4, the latter forms one pole of the condenser battery. The tank 4 should therefore be insulated from ground and the cooling medium should be led to the supply pipe 9 by means of an insulating tube. The other pole or terminal connection of the condenser is carried through the tanks by means of the bushings 5 and 6.

Figs. 4 and 5 show an arrangement in which the cooling wall 2 is common to both of two tanks 3, enclosing the condenser elements 1 placed on each side of the wall which has the protruding condenser foils pressed against it. The wall is provided with a cooling spiral coil 9. The tanks 3 are enclosed in an outer tank 4 and this as well as the inner tanks 3 are filled with a medium under pressure.

I claim as my invention:—

1. In a condenser of the character described, a tank, a medium under pressure in the tank, a cooling wall subjected to the pressure of said medium, condenser elements enclosed in the tank and having their foils pressed against the said wall, a second wall serving as a support for the cooling wall, and means for applying to the second wall fluid pressure equal to the pressure of the said medium in the tank to maintain the said cooling wall in plane form.

2. In a condenser of the character described, a tank, a medium under pressure in the tank, a cooling wall subjected to the pressure of said medium, condenser elements enclosed in the tank and having their foils pressed against the said wall, a second wall serving to support the said cooling wall, depressions formed in said walls and secured to each other, and means for applying fluid pressure to the second wall to support both walls.

3. In a condenser of the character described, a tank, a medium under pressure in the tank, a cooling wall subjected to the pressure of said medium, condenser elements enclosed in the tank and having their foils pressed against the said wall, a second wall adjacent to the cooling wall, cooling and supporting flanges between said walls, and means for applying fluid pressure to the second wall to support the cooling wall in plane form.

4. In a condenser of the character described, a tank, a medium under pressure in the tank, a cooling wall subjected to the pressure of said medium, condenser elements enclosed in the tank and having their foils pressed against the said wall, means for applying fluid pressure to said wall to maintain same in plane form, and at least one elastic wall for maintaining fluid pressure upon the wall.

5. In a condenser of the character described, a tank, a medium under pressure in the tank, a cooling wall subjected to the pressure of said medium, condenser elements enclosed in the tank and having their foils pressed against the said wall, means for maintaining said wall in plane form against the pressure of said medium, means for supplying cooling medium to said wall, and means for electrically insulating the same from said wall.

BROR HANSSON.