Feb. 25, 1958 H. ARNAUD 2,825,035

APPARATUS FOR THE INSTANTANEOUS HEATING OF LIQUIDS

Filed April 23, 1956

Fig. 1

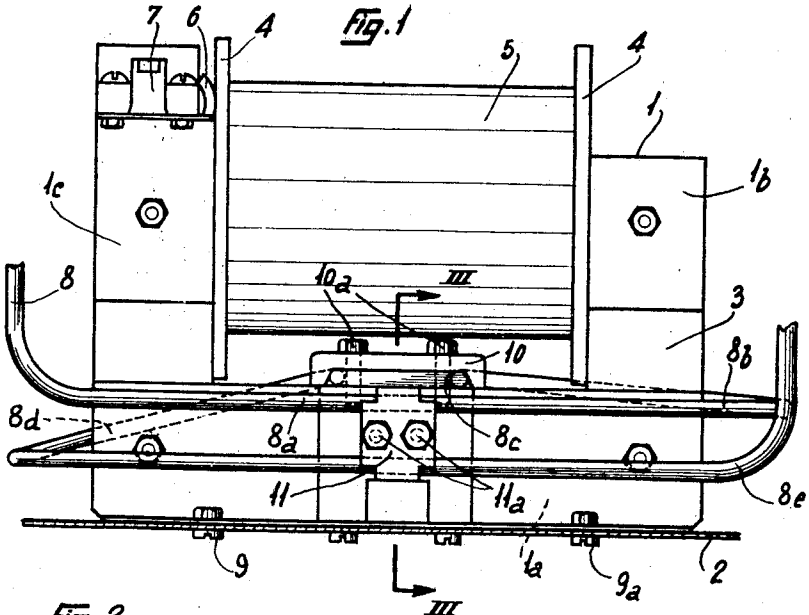


Fig. 2

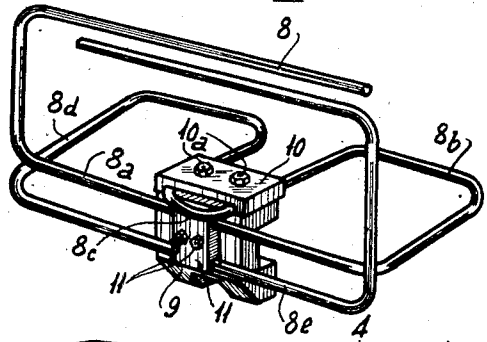
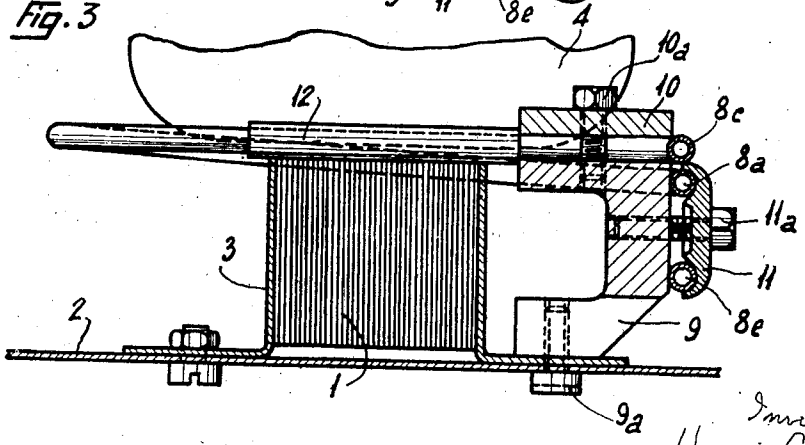


Fig. 3



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United States Patent Office

2,825,035

Patented Feb. 25, 1958

2,825,035

APPARATUS FOR THE INSTANTANEOUS HEATING OF LIQUIDS

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Application April 23, 1956, Serial No. 580,091

3 Claims. (Cl. 336—220)

This invention relates to apparatus for the instantaneous heating of liquids, particularly fuel oil, in which the tube through which passes the fuel oil to be heated forms the secondary coil of a heating transformer. An apparatus of this kind is described in my prior patent No. 2,616,022, granted October 10, 1952.

It is an object of the invention to provide an apparatus in which this tube can be put in, and removed from, position without it being necessary to take the transformer to pieces.

According to the invention, the tube through which the fluid passes and which forms the secondary of the heating transformer is coiled in such a manner as to form open loops so that it can be placed in position around the core of the transformer with only a slight deformation and without it being necessary to take the transformer to pieces.

In the accompanying drawings:

Figure 1 is an elevation of a heating transformer provided with a secondary coil,

Figure 2 is a perspective view showing the secondary coil alone, and

Figure 3 is a section (to a larger scale) on the line III—III of Figure 1.

In the embodiment of the invention illustrated in the drawings, a heating transformer has a core **1** which is mounted on a plate **2**, for example, the bottom of a box, by means of gussets **3**.

This core carries the primary coil which is mounted between side plates **4** and is covered by a protective sheath **5** (Figure 1). The several connections **6** of the primary which abut the end cap **7** are designed for the connection of the electric current supply leads.

The secondary of the transformer is constituted by a portion of tube **8** through which flows the fuel oil to be heated. This tube **8** has a straight branch **8***a* which runs along side a lower bar **1***a* of the core **1** then it is bent into a loop **8***b* around an upright **1***b* of the core so

as to pass above the lower bar **1***a* about the middle of it; the tube **8** is then bent to form an elbow **8***c* and is then again bent in the form of a second loop **8***d* around an upright part **1***c* of the core in order to terminate in a branch **8***e* which runs along side the lower bar **1***a*. As shown in Figure 2 the tube **8** has two open loops **8***b* and **8***d* separated by an elbow portion **8***c* which passes close to the ends **8***a* and **8***e* of the two loops.

The base plate **2** is provided with a support **9** fixed, for example, by means of a screw **9***a*, for the fixing of the tube **8** by means of a cap **10** which is fitted over the elbow **8***c* and is held in place by a screw **10***a* and by means of a stirrup **11** which fits over the branches **8***a* and **8***e* and is fastened by a screw **11***a*. The support assembly **9** and the cap stirrup and screws which it carries ensures the secondary circuits are closed electrically by the connection of the elbow **8***c* with the branches **8***a* and **8***e*.

In order to disassemble the tube **8**, it is sufficient to remove the cap **10** and the stirrup **11** and then to take the elbow **8***c* out of the core of the transformer which can easily be done with only a slight deformation of the tube which is made of a malleable material such as a copper base alloy.

The tube **8** can be put in position by the reverse operation without difficulty.

It is of advantage to provide the elbow branches **8***c* with protective muffs **12** (Figure 3).

What I claim is:

1. An apparatus for heating liquids comprising in combination a transformer of the closed core type having branches connected together by upright parts; a metallic tube, a portion of which is adapted to constitute the secondary circuit of said transformer, said portion being bent into a pair of open loops partially surrounding each of said upright parts respectively, said loops being separated by an elbow portion passing between said parts and the extremities of said portion passing along one of said branches close to said elbow portion; and means for connecting said extremities with said elbow portion.

2. The combination of claim 1 wherein said means are adapted to secure the tube with respect to the core.

3. The combination of claim 2 wherein said means comprise a support secured to said core and bridging means adapted to secure said elbow portion and said extremities to said support.

References Cited in the file of this patent

UNITED STATES PATENTS

2,570,762	Caliri	Oct. 9, 1951
2,616,022	Arnaud	Oct. 28, 1952