

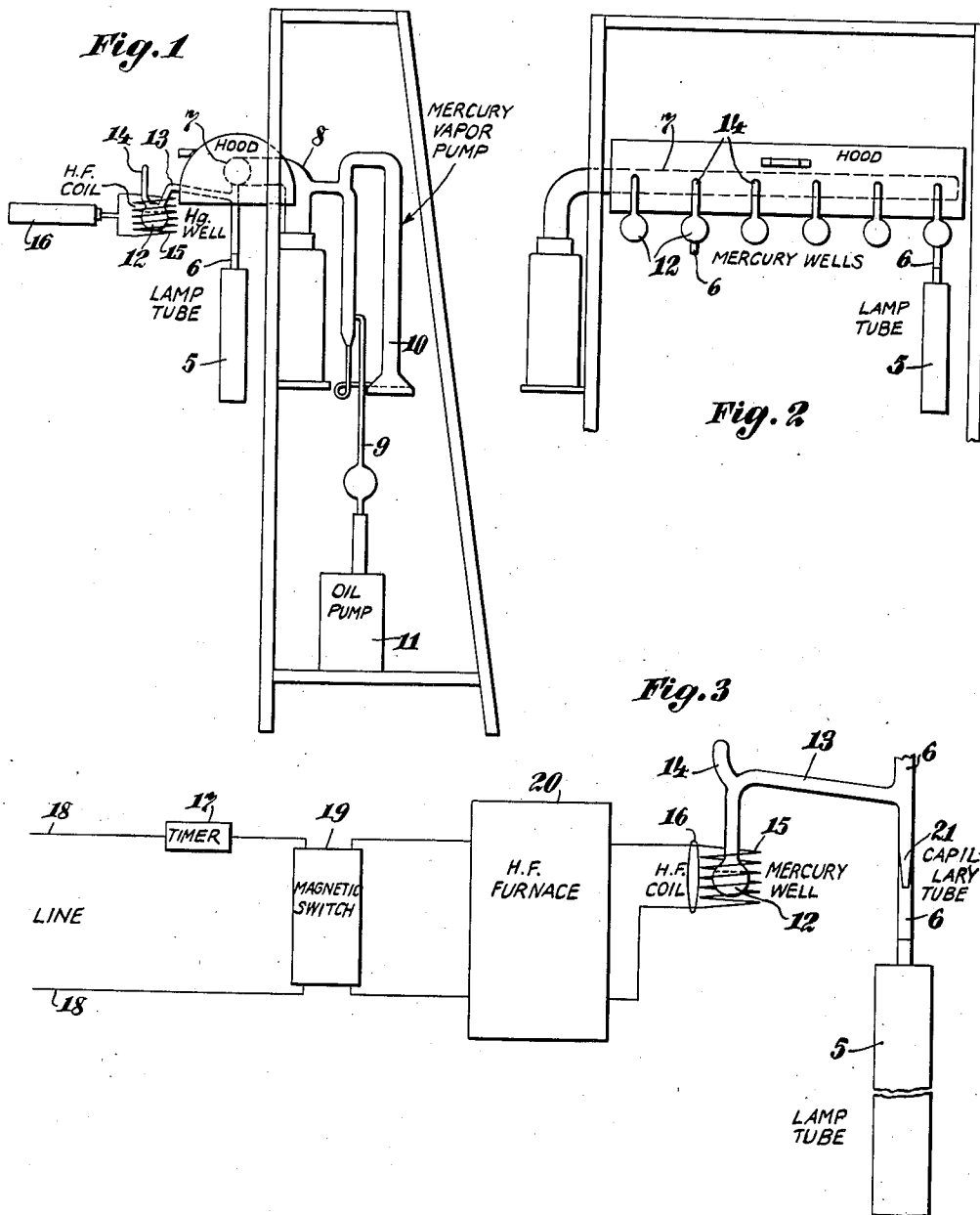
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MEASURING MERCURY INTO FLUORESCENT LAMPS

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MEASURING MERCURY INTO FLUORESCENT LAMPS

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5 Claims. (Cl. 176-122)

The invention here disclosed relates to the furnishing of fluorescent lamps and the like with measured quantities of mercury.

Objects of the invention are to provide a practical method and means for accurately supplying the requisite small quantities of mercury employed in fluorescent lamps and the like, and which will work in readily with existing equipment now used in the manufacture of such devices.

Other objects and purposes of the invention will appear as the specification proceeds.

The drawing accompanying and forming part of the following specification illustrates one practical commercial embodiment of the invention, but it is realized that changes and modifications may be made all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 is a schematic end view of one form of apparatus suited to the practice of the invention.

Fig. 2 is a broken front view of the same.

Fig. 3 is a wiring diagram and part detail view.

In the several views, a fluorescent lamp tube is indicated at 5, in process of evacuation, temporarily connected by tubing 6, with a manifold 7, connected at 8, 9, with a mercury vapor pump 10, and oil pump 11.

A mercury well or reservoir 12, is shown connected by a branch 13, with the lamp evacuating tube 6, there being in practice one such mercury well for each evacuating tube. These wells may have filling nipples such as indicated at 14.

Mercury in the wells 12 is distilled off by surrounding or enclosing high frequency heating coils 15 and the so purified vapors are drawn off by the evacuating means 9, 10, through the branches 13, into the evacuating tubes 6. The branches 13 lead out of the tops of the wells 12 and are shown in Fig. 1 inclined downwardly into the tubes 6, which open into the tops of the lamp tubes. The heavier mercury vapors are thus in effect trapped and dropped down into the lamp tubes, the applied suction being regulated and the action timed to effect this result.

The high frequency coils may be carried by supports 16, which may be raised to enclose and lowered from about the wells, by hand, or by mechanism, automatic or controlled. Alternatively the coils may remain in place about the wells and control be effected wholly by the circuit.

In the diagram, Fig. 3, a timer 17, is shown in the power circuit 18, governing a magnetic

switch 19 for the high frequency "furnace" 20, which supplies the energy to the high frequency coils 15.

In Fig. 3 there is also shown an enclosed capillary 21 for discharging and trapping the distilled mercury vapor into the lamp tube.

In a present preferred method of operation the high frequency coils are raised by hand about the mercury stills as evacuation and degasification are completed, as indicated by appearance of the tubes and held there while with the almost immediate boiling of the mercury, the required amount or number of drops of mercury is or are observed, condensing and dropping into the lamp tube. Very accurate results are obtainable in this manner and a certain latitude of judgment may be observed, thus to admit only a slight or a greater amount of the distilled, purified, mercury.

The use of the timer may be desirable for more continuous, rapid and uniform high production, economical manufacture, in which case, the coil, or the coils, in the event of a multiple tube machine, such as shown, may remain in place and the timer be thrown in, each time a tube or tubes is or are ready for the mercury.

As only one or only a few drops of mercury is or are required for each lamp, the wells may be quite small and this in turn means that the distillation and transfer of mercury vapors to the lamp envelope is quick and positive.

What is claimed is:

1. The method of supplying a small quantity of purified mercury to a fluorescent lamp in course of manufacture, which comprises connecting a confined body of mercury into the exhaust system by which the tube of the lamp is evacuated and surrounding said confined body with a high frequency and passing high frequency electric current through said coil while the tube is undergoing evacuation and for a time sufficient to distill off mercury vapors from said confined body into said tube to the amount desired in the lamp.

2. The method of supplying a small quantity of purified mercury to a fluorescent lamp in course of manufacture, which comprises connecting a confined body of mercury through a capillary passage into the exhaust system by which the tube of the lamp is evacuated and subjecting said confined body to high frequency electric current while the tube is undergoing evacuation and for a time sufficient to distill off mercury vapors from said confined body into said tube to the amount desired in the lamp.

3. The method of supplying a measured quantity of purified mercury in a vaporous state to an evacuated lamp in course of manufacture and which comprises connecting a confined body of liquid mercury with the tube by which the lamp envelope is evacuated and while the envelope is in course of evacuation and surrounding said confined body of mercury with a high frequency electric field for a time sufficient to distill off an amount of mercury vapor sufficient for that required in the lamp and whereby such measured volume of mercury vapors will be transported by the evacuation, from the region of the confined body of liquid mercury into the envelope of the lamp being evacuated.

4. Apparatus for supplying measured quantities of mercury to fluorescent lamps, comprising in combination with a lamp evacuating tube, a mercury well for confining and holding a body of liquid mercury connected at the top with the side of said tube, a high frequency coil for heating and distilling the mercury in said well and means for enabling regulation of such distillation including a support for locating and holding said high frequency coil in surrounding relation about said mercury well.

5. Apparatus for supplying measured quantities of mercury vapor to fluorescent lamps, comprising in combination with a lamp evacuating tube, a mercury well for holding a body of liquid mercury and connected at the top with the side of said tube, through a vertically extending substantially centrally located capillary passage, a high frequency coil for heating and distilling the mercury in said well and means for enabling regulation of such distillation including a support for locating and holding said high frequency coil in surrounding relation about said mercury well and means for timing the mercury distilling effect of said high frequency coil.

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