

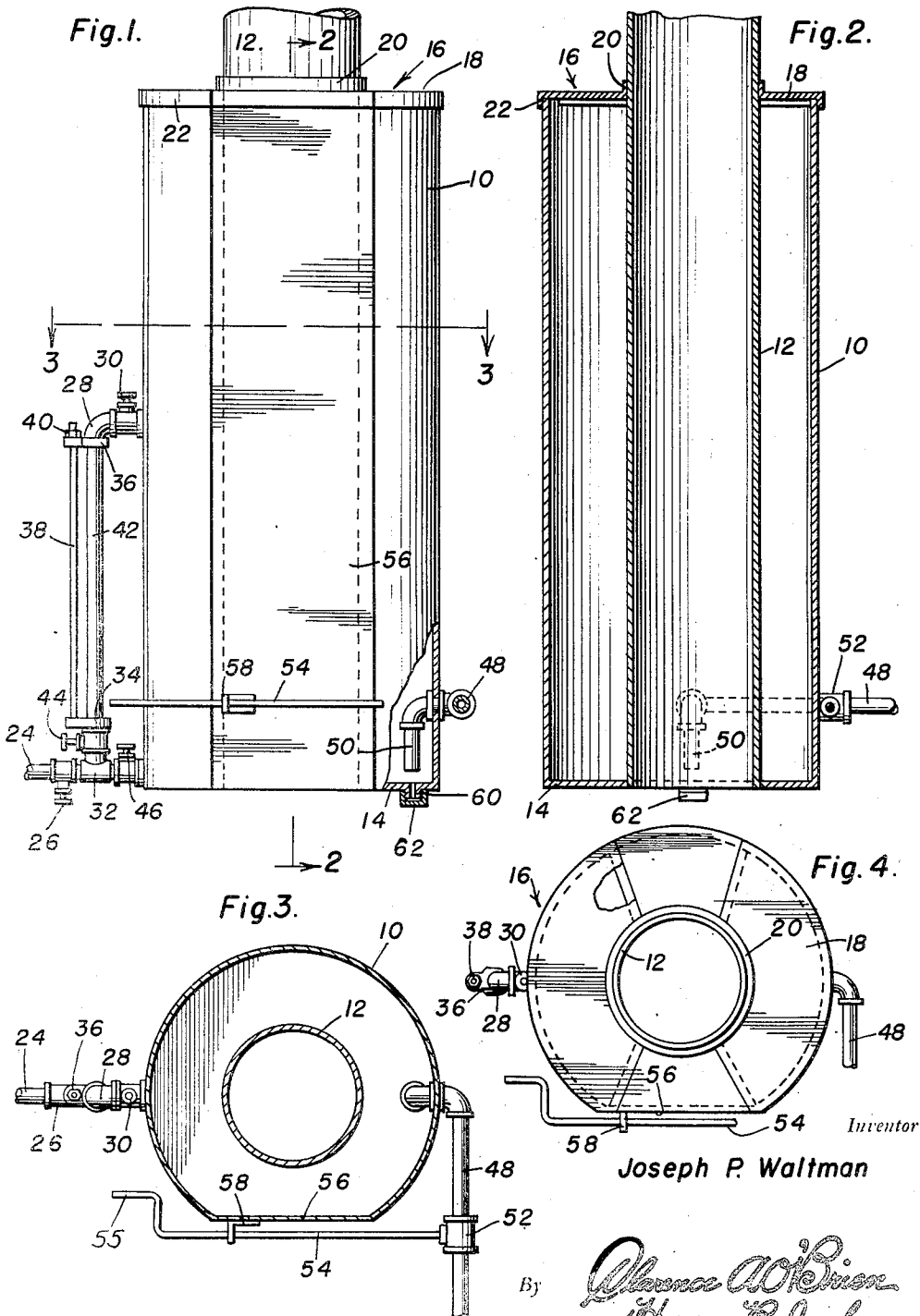
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PREHEATING UNIT FOR EVAPORATORS

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## PREHEATING UNIT FOR EVAPORATORS

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4 Claims. (Cl. 126—364)

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This invention relates to new and useful improvements in preheating units for evaporators and the primary object of the present invention is to provide a device that will preheat a fluid entering an evaporator and thus reduce the normal heat capacity necessary for the evaporator.

Another important object of the present invention is the provision of a unit so designed as to reduce the normal length of time necessary for fluid to be activated within the evaporator.

A further object of the present invention is to provide a device for the foregoing purposes that conserves the heat usually wasted by the furnace of such an evaporator system.

A still further aim of the present invention is to provide a preheating unit that is simple and practical in construction, efficient and reliable in operation, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the present invention applied to a smoke stack and with the parts of the device and stack broken away and shown in section;

Figure 2 is a vertical sectional view taken substantially on the plane of section line 2—2 of Figure 1;

Figure 3 is a horizontal sectional view taken substantially on the plane of section line 3—3 of Figure 1; and,

Figure 4 is a top plan view of Figure 1 and parts of the unit broken away and shown in section.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a substantially cylindrical receptacle that embraces a furnace smoke stack 12 in spaced apart relationship. The lower edge of the receptacle is fixedly connected to the stack by an annular bottom 14. The upper end of the receptacle is closed by a cover designated generally by the numeral 16, comprising arcuate segments 18. The upper edges of the segments are turned upwardly to provide arcuate flanges 20 that embrace stack 12 and the other edges of these segments are turned downwardly to provide flanges 22 that bear against the upper edge of the receptacle.

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Leading from a source of fluid is a conduit 24, that is extended into the lower portion of the receptacle and fluid therein is controlled by a manually operated valve 26.

Communicating with the upper portion of the receptacle is a bypass conduit 28, controlled by a manually operated valve 30.

Disposed on conduit 24, between the terminal end of conduit 24 and valve 26, is a T-fitting or joint 32 engageably receiving a lower internally threaded coupling ring 34. An upper internally threaded coupling ring 36 is engageably received on the free end of conduit 28 and the rings 34 and 36 are adjustably connected to each other by a rod 38 screw-threaded at one end to engage a nut 40.

Receivably engaged in the respective coupling rings 34 and 36 are the externally threaded ends of a transparent pipe section 42 that communicates with conduits 28 and 24.

A manually operated valve 44 is operatively carried by joint 32 to regulate fluid entering section 42 and a still further manually operated valve 46 is carried by conduit 24 between the inner end of the conduit 24 and joint 32, for regulating fluid entering the lower portion of the receptacle.

Carried by the receptacle 10 preferably at the opposite side thereof from conduit 24 is an outlet conduit 48 that leads to an evaporator (not shown). This conduit 48, is provided with a vertically disposed section 50 within the receptacle, the lower end of which is spaced from the bottom 14.

Operatively mounted on conduit 48 is a valve 52 manually operated by a crank handle or lever 54 having a hand receiving portion 55. This handle is preferably in spaced parallelism to the flat side 56 of the receptacle. A rack or journal bracket 58 carried by the side 56 supports the handle 54.

An externally threaded drain boss 60 is provided in bottom 14 and is selectively closed or opened by an internally threaded drain cap 62 receivably engaged on said boss.

In the practical use of the device, the valves 26 and 46 are opened and valve 44 closed so that fluid may enter the lower portion of the receptacle to fill the same.

As heat is built up in the furnace (not shown) the heat rises in stack 12 and tends to heat the fluid in receptacle 10. Having preheated the fluid in this manner, the crank handle 54 is rotated to permit the heated fluid to pass outwardly of the receptacle by way of conduit 48

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to the evaporator. In this manner, the time necessary for the fluid to be activated within the evaporator is reduced as well as the amount of heat necessary for the normal operation of the evaporator.

The liquid in the lower portion of the receptacle is at a slightly lower temperature than the liquid at the upper portion of the receptacle, therefore, should additional liquid be admitted to the receptacle through the conduit 24 this additional supply of liquid would tend to cool the liquid in the lower portion of the receptacle. Consequently, the conduit 24 is used initially to place a certain amount of liquid into the receptacle after which the valve 46 is closed and the valves 26, 44 and 30 are opened to permit the liquid to enter the receptacle through the by-pass conduit to contact the column of liquid at its point of highest temperature.

Also, by closing valve 26 and opening valves 30, 46 and 44 when the level of the liquid is below the valve 30, the liquid in the receptacle by its own weight or gravitational force, will tend to rise in section 42 thereby indicating the amount of the liquid within the receptacle.

To drain the fluid from the receptacle, drain 62 is merely removed.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A preheating unit for evaporators comprising a cylindrical receptacle adapted to surround a smoke stack, said receptacle including upper and lower portions, a fluid inlet conduit leading from a fluid source and communicating with the lower portion of said receptacle, an outlet conduit leading from the lower portion of said receptacle and adapted to extend to an evaporator, valve means controlling the flow of liquid in said outlet conduit, a pair of manually operated valves controlling the flow of liquid in said inlet conduit, a by-pass conduit leading from said inlet conduit and having an upper end communicating with said receptacle intermediate the upper and lower portions thereof and a lower end in communication with said inlet conduit between said pair of valves, and still further valve means controlling the flow of liquid from the inlet conduit into said by-pass conduit, said by-

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pass conduit including a transparent substantially vertically disposed section for indicating the level of liquid within said receptacle when the liquid level is below the upper end of the by-pass conduit.

2. The combination of claim 1 wherein said outlet conduit includes a substantially vertically disposed pipe section disposed in said receptacle and including a lower open end spaced from the bottom of said receptacle and disposed within the receptacle.

3. The combination of claim 1 wherein said first mentioned valve means includes a manually operated valve, a crank handle for operating said valve, and a bearing carried by said receptacle on the outer periphery thereof and rotatably supporting said crank handle, said crank handle including a hand receiving portion disposed adjacent the valves for said inlet conduit to permit actuation of all of said valves from one side of the receptacle.

4. A preheating unit for evaporators comprising a receptacle adapted to surround a portion of a smokestack, said receptacle including upper and lower portions, a fluid inlet conduit leading from a source of liquid and communicating with the lower portion of the receptacle, a pair of spaced valves controlling the flow of fluid passing through said inlet conduit, a combined by-pass conduit and level tube of translucent material, said combined by-pass conduit and level tube having a lower end portion coupled to said inlet conduit between said pair of valves and an upper end portion attached to the receptacle intermediate the upper and lower portions of the receptacle, valve means for controlling the flow of fluid through the combined by-pass conduit and level tube, and outlet means at the lower portion of the receptacle for a liquid in the receptacle.

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