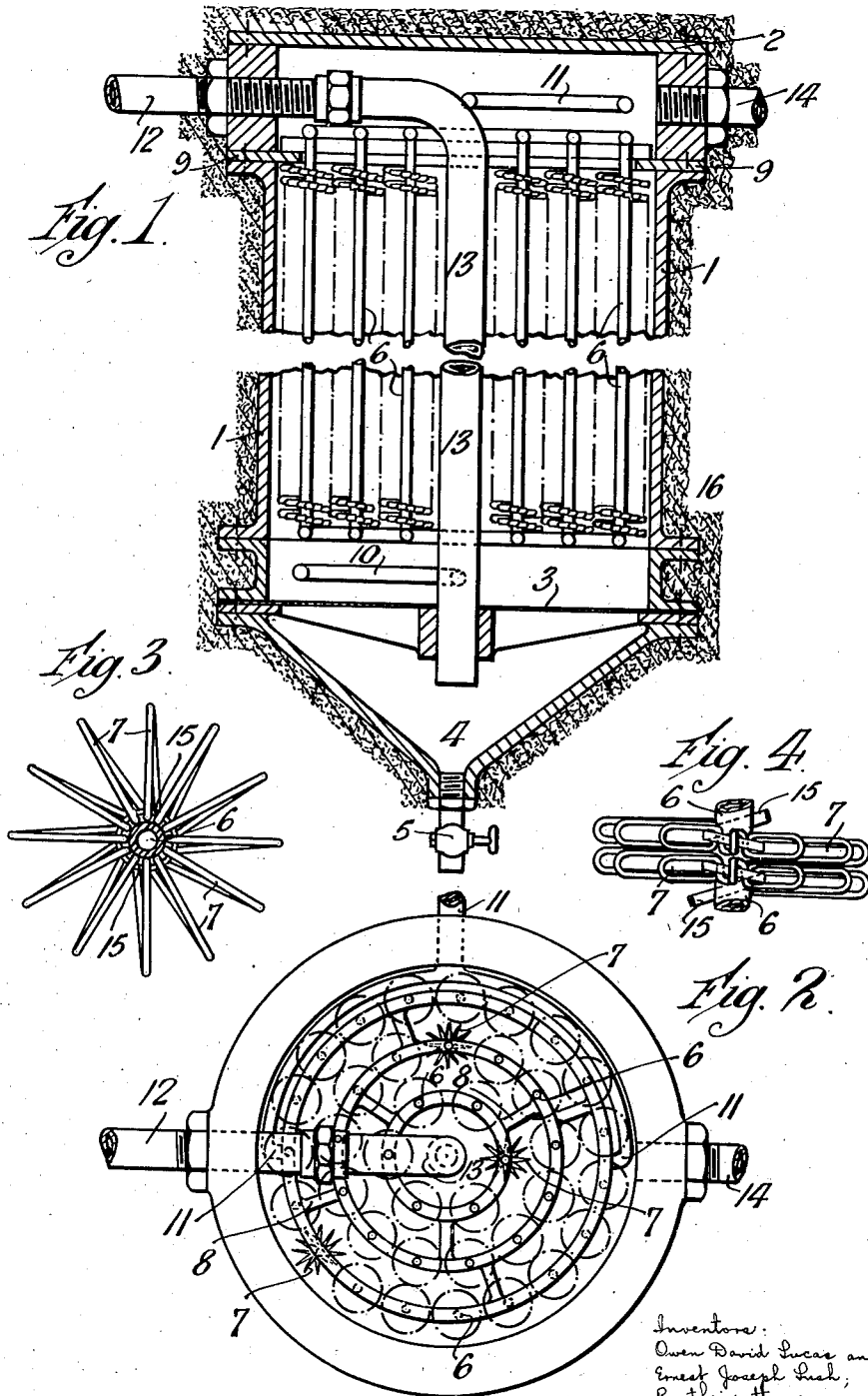


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O. D. LUCAS ET AL,
APPARATUS FOR REFINING VAPORS

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APPARATUS FOR REFINING VAPORS

Owen David Lucas and Ernest Joseph Lush,
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2 Claims. (Cl. 196—96)

This invention relates to improvements in apparatus for use in refining vapors. It is customary in this art to pass the vapors through a mass of adsorbent material in a powder or granular state, e. g. granulated fuller's earth, in order to extract undesired matter present in the vapors. A problem in this connection is to initiate and to maintain in the body of the adsorbent material a substantially uniform temperature.

10 The present invention has for its object to provide suitable apparatus for heating uniformly the mass of material through which the vapor is passed, the means employed being of a nature which will enable the adsorbent material to be readily removed, to be replaced for example by a charge of fresh material.

The apparatus according to the invention comprises a casing in which is mounted a nest of tubes adapted to be internally heated and which are provided with gills of interstitial formation whereby substantially all parts of the effective space within the casing are penetrated by the gills and yet when the space is filled with adsorbent material in a powdered or granulated state, as for example granulated fuller's earth, such material will be readily displaceable through the gills along the spaces between the actual tubes. Thus in accordance with the invention a nest of vertical tubes may be mounted in the casing, the tubes being provided with gills formed of looped wire, the spacing and arrangement being such that substantially all parts of the space to be occupied by the adsorbent material in the casing are penetrated by the gills.

35 The invention is illustrated by way of example in the accompanying drawing, of which Figure 1 is a sectional elevation of the apparatus and Figure 2 is a plan thereof with the top cover removed, Figure 3 is an enlarged plan view of a gilled tube, and Figure 4 is an elevation of the same.

Referring to the drawing, 1 is the cylindrical casing with a top cover 2 and a false bottom 3 formed by a spider covered with gauze of sufficiently fine mesh to retain the adsorbent material which is to occupy the casing. 4 is a sump at the bottom of the casing provided with a drain cock 5.

Mounted within the casing is a nest of vertical tubes 6 each provided with gills 7 (to be more particularly described hereinafter), the spacing and arrangement of the gilled tubes being such that there is no place of substantial volume which is not penetrated by the gills. The tubes are connected at the top and bottom to systems of ring headers secured concentrically by spacing

members 8, the top system being supported by a ring 9.

A heating medium of a nature which may depend upon the temperature to be maintained is circulated through the nest of tubes, being admitted at the bottom through an inlet 10 and being taken out at the top through an outlet 11. If electrical heating is employed, the headers will be replaced by electrical leads and connections.

10 The vapor to be refined is brought in at the top through the inlet pipe 12 whence it passes through a pipe 13 down the centre of the casing. The vapor emerges from the bottom of the pipe 13 in the sump portion of the casing and it will then rise through the gauze of the false bottom 3 and up through the body of the adsorbent material which occupies the casing. The vapor outlet at the top of the casing is shown at 14.

20 The nature of the gills which is not clearly apparent in Figures 1 and 2 is shown in more detail in the other figures of the drawing. The gills are formed of looped wire which follows a helical form round the tubes, the radially projecting loops of the wire being bound at their roots to the tube surface by means of a metal strip 15. Thus the gills provide interstitial spaces and although they serve the purpose of conducting the heat of the tubes to an extended distance from the actual tube surface and transmitting it to all parts of the mass of adsorbent material, they enable the adsorbent material to fall through the interstices and to be discharged from the casing upon removal of the false bottom and sump portion of the casing.

35 For heat insulation purposes lagging material 16 is provided round the casing.

By the use of the above described apparatus a uniform distribution of heat is readily initiated and maintained, this being obtained by an internal heating arrangement which though having a very extended surface will nevertheless not cause the adsorbent material to clog up so that it cannot be conveniently removed.

45 It will be understood that the invention is applicable not only to the case where a stationary body of adsorbent material is used but also to the case where a moving column is used and that in the latter case the apparatus will be provided with appropriate continuous feeding and discharging means for the adsorbent material.

What we claim is:—

1. Apparatus for use in refining vapors comprising a casing for holding pulverulent or gran-

ular adsorbent material through which the vapors to be refined will be passed, there being mounted within said casing a nest of tubes adapted to be internally heated which are provided with gills of interstitial formation penetrating into substantially all parts of the effective space within the casing.

2. Apparatus for use in refining vapors comprising a casing for holding pulverulent or gran-

ular adsorbent material through which the vapors to be refined will be passed, there being mounted within said casing a nest of vertical tubes adapted to be internally heated which are provided with gills formed of looped wire penetrating into substantially all parts of the effective space within the casing.

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