

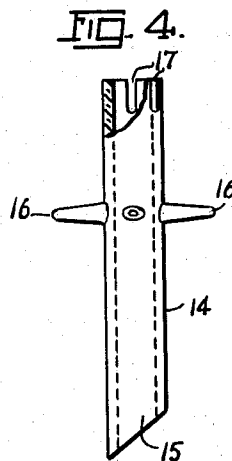
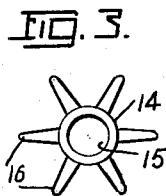
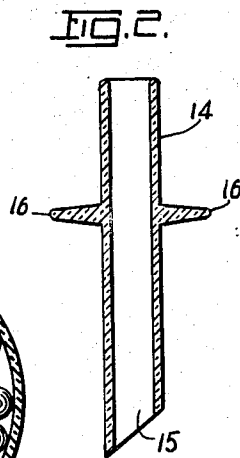
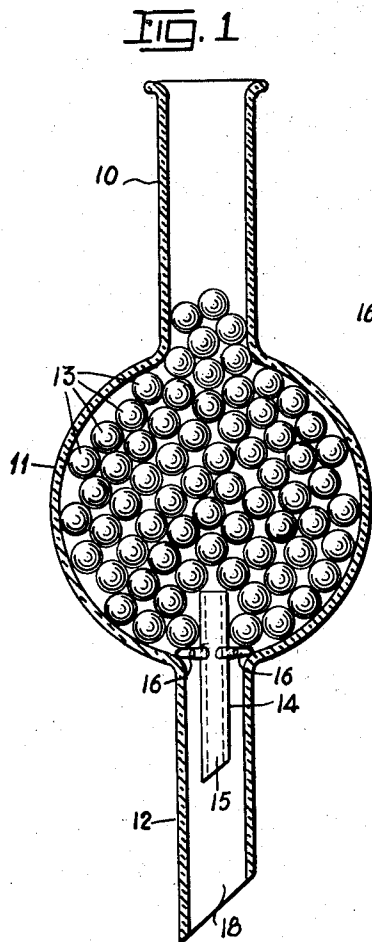
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PACKED TOWER

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PACKED TOWER

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4 Claims. (Cl. 261—95)

The present invention relates to packed towers, and more particularly deals with a packed tower provided with a retainer for the packing material in a packed head.

Hitherto, packed towers have been provided with a support for the packing material consisting of a wad of fibrous material or a disk of coarse porous material or a perforated disk or plate or the like. In each case the retainer for the packing material has effectively cut down the flow of vapors through the tower, and reactions carried out in such packed towers have been slowed up considerably as a result.

The packed tower of the present invention is provided with a retainer which has the advantage of permitting ready flow of vapors upwards into contact with the packing material. The retainer forming a part of the packed tower head of the present invention has the advantage of not substantially restricting the flow of vapors by virtue of the fact that it does not reduce materially the cross sectional area of the member through which the vapors must flow upwardly into contact with the packing material.

The present invention will be fully understood from the following description taken in connection with the annexed drawing, wherein:

Fig. 1 is a diagrammatic representation, partly in cross section, of a packed tower head showing the packing material and the packing material retainer in position;

Fig. 2 is a cross sectional enlarged view of the retainer illustrated in Fig. 1;

Fig. 3 is a plan view of the retainer of Fig. 2; and

Fig. 4 is an elevational view, partly in cross section, of a modified form of the retainer of Fig. 2.

Referring to the drawing in detail, 10 is the top portion, 11 the central portion and 12 the bottom portion of a packed tower head. The central portion 11 is provided with packing material 13 supported on a retainer 14.

The retainer 14 is illustrated in elevational cross section in Fig. 2 and consists of a member provided with a longitudinal aperture 15 and a plurality of protrusions 16.

In Fig. 4 is illustrated a modification of the retainer of Fig. 2. It will be noted that it is provided on its upper portion with a plurality of longitudinal slots 17 the advantages of which will be discussed hereinafter.

Referring again to Fig. 1, vapors enter the lower portion 12 of the packed head through the aperture 18 and flow upwardly into the aperture 15 of the retainer 14 as well as around the retainer

14 and upwardly through the spaces between the protrusions 16 on the retainer 14. It will be noted that the greatest proportion of the cross sectional area of the aperture 18 is retained for the flow of vapors through and around the retainer 14 by virtue of the particular construction of said retainer.

When round beads are employed as packing material and the diameter of the beads is slightly larger than the diameter of the aperture 15 in the retainer 14, it frequently happens that one of the beads will become positioned directly over the upper portion of the retainer 14 and thus completely stop the flow of vapors through the aperture 15 by sealing off its outlet at the top. Under such circumstances, it is advantageous to use a retainer according to the modification illustrated in Fig. 4. It will be noted that such a retainer is provided with a plurality of longitudinal slots 17 on the upper portion thereof. When such a modification is employed, the flow of vapors through the aperture 15 in the retainer 14 will not be stopped as a result of one of the beads sealing off the top of the retainer 14 since the vapors would then flow outwardly through the slots 17. When the packing material employed is angular in shape, or of a nature which will prevent sealing off of the aperture 15 in the retainer 14 at the top, the retainer of Fig. 2 will prove quite satisfactory; however, the retainer of Fig. 4 may be used under such circumstances with equally satisfactory results as when the packing material is in the form of round beads.

It will be understood that while the present invention has been described herein and illustrated in the drawing in embodiments particularly adaptable for use in the laboratory, it is not intended thereby to limit the scope of the present invention to any such embodiments, in view of the fact that the present invention may be modified and applied effectively and advantageously in connection with pilot plant and industrial equipment of the type herein considered.

It should be understood that it is not intended to have the present invention limited to or circumscribed by the particular details of construction, arrangement of parts, materials, sizes, and shapes herein described or illustrated in the drawing, in view of the fact that this invention is susceptible to modifications depending on individual conditions and preference without departing from the spirit of this disclosure and the scope of the appended claims.

I claim:

1. In a packed tower, a tubular element enlarged intermediate its ends to form a chamber

adapted to be filled with discrete particles of packing material of smaller size than the internal cross-sectional area of said tubular element, and means for retaining said material in said chamber and comprising a tubular section loosely fitting said tubular element, and having radially projecting arms intermediate its ends, said arms being adapted to rest on said element at the point where the latter enlarges into said chamber, the length of said section from said protrusions to the end within said chamber being small in relation to the dimension of said chamber axially of said tubular element.

2. In a packed tower, a tubular element enlarged intermediate its ends to form a chamber adapted to be filled with discrete particles of packing material of smaller size than the internal cross-sectional area of said tubular element, and means for restraining said material against egress from said chamber, said means comprising a tube section of smaller outside diameter than the inside diameter of said tubular element, said section having radial projections at a distance from its upper end that is small in relation to the dimension of said chamber axially of said tube, whereby said section is supported by said projections at the lower junction of said element and chamber, the portion of said section below said projections extending downwardly into the lower portion of said tubular element.

3. In a packed tower, a tubular element enlarged intermediate its end to form a chamber adapted to be filled with discrete particles of material of a size smaller than the internal cross-sectional area of said tubular element, and means for preventing egress of said material from said chamber said means comprising a tube section having an outside diameter less than the internal diameter of said tubular element, said section having radial arms at a distance from its upper end that is not greater than one-fifth of the dimension of said chamber axially of said tube, whereby said section is supported by said arms at the lower junction of said element and chamber, said section having openings through its wall closely adjacent its upper end.

4. Means for retaining discrete particles within a tube enlarged between its ends to form a chamber and having an exit opening larger than the particles of said material, comprising a tubular section of smaller external diameter than said opening, and smaller internal diameter than said particles, a plurality of arms extending radially from said section at a distance below its upper end that is small in comparison with the vertical dimension of said chamber axially of said tube, said arms acting to support said tubular section within said opening.