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AIR FILTER LATCH ARRANGEMENT

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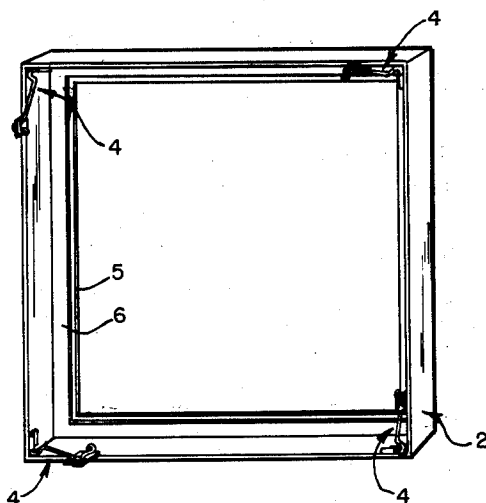


FIG. 1

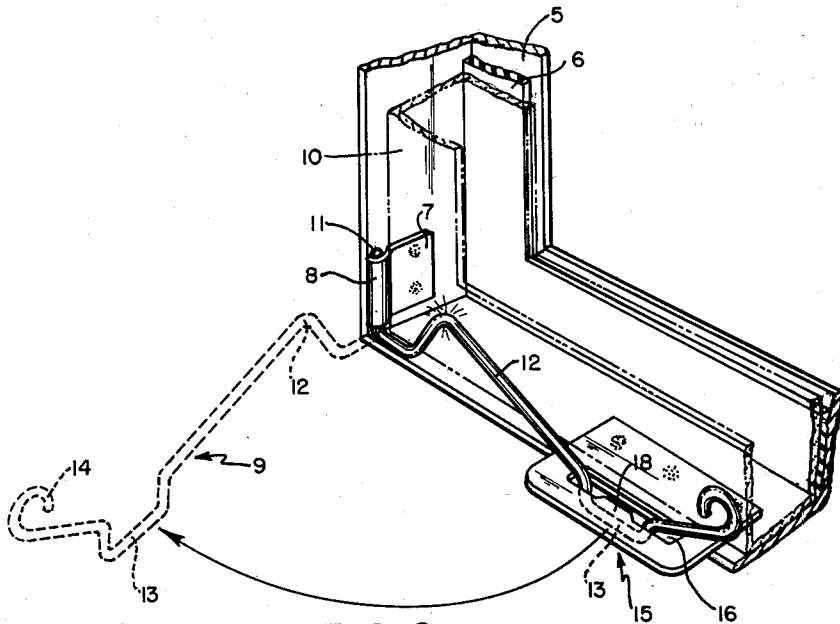


FIG. 2

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1

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AIR FILTER LATCH ARRANGEMENT

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4 Claims. (Cl. 189—35)

The present invention relates to open-ended unit filter cell support frames and more particularly to an improved latching arrangement for releasably retaining unit filter cells within such supporting frames.

It has been the practice in the gas cleaning art to mount unit filter cells in auxiliary support frames, the support frames having unobstructed end-to-end openings except for marginal sealing flanges against which the side walls of the filter cells are releasably held in sealed relationship by means of one of a number of known latching arrangements. These latching arrangements of the past have been somewhat complex in construction and operation, have often obstructed, at least in part, the path of gas flow, and have presented problems in shipping and storage.

In accordance with the present invention, an improved latching arrangement for a filter cell support frame is provided which is straightforward and economical in construction and maintenance, which requires a minimum of operating parts, which presents a minimum of obstruction to the gas stream to be treated, and which lends itself to ready and economical shipping and storage.

Various other features of the present invention will become obvious to one skilled in the art upon reading the disclosure set forth hereinafter.

More particularly, the present invention provides in an open-ended unit filter cell support frame having a marginal sealing flange disposed therein, an improved latching arrangement for releasably retaining a unit filter cell within the support frame against the marginal sealing flange comprising: a longitudinally extending latch member pivotally mounted in cantilever fashion at one end to the support frame, the latch member including along its length bearing means, tongue means and grip means; and, keeper means on the support frame to receive the tongue means of the latch member; the bearing means of the latch member being offset from the tongue means to engage firmly against a filter cell disposed within the support frame when the tongue means is inserted into the keeper means.

It is to be understood that various changes can be made in the arrangement, form and construction of the apparatus disclosed herein without departing from the scope or spirit of the present invention.

Referring to the drawings which disclose one advantageous embodiment of the present invention:

FIGURE 1 is an isometric view of a filter cell supporting frame with the inventive latching arrangement incorporated therein;

FIGURE 2 is an enlarged isometric view of a corner portion of the supporting frame structure of FIGURE 1, further disclosing in broken lines a portion of a unit filter cell installed in such support frame.

In the advantageous embodiment of the invention disclosed, an open-ended support frame 2 of rectangular shape is set forth, the frame being provided at each corner thereof with the inventive latching arrangement designated broadly by reference numeral 4. It is to be understood that frame 2 can be fabricated from any one of a number of suitably rigid materials and advantageously a sheet metal of suitable gauge can be used. As can be seen in FIGURE 1 of the drawings, frame 2 includes marginal sealing flange 5 which extends along the inner periphery of the frame at the rear portion thereof. Seal-

2

ing flange 5 is provided with a suitable sealing gasket 6 on one side thereof and serves to receive the side wall of a unit filter cell supported by the frame in a manner described hereinafter.

As can be seen more fully in FIGURE 2, each latching arrangement 4 includes a hinge plate 7 fastened to one side of supporting frame 2 by some suitable means such as welding. Hinge plate 7 is bent as at 8 to form a channel which accommodates hinge-end portion 11 of longitudinally extending latch rod 9. Rod 9 can be made from any one of a number of suitably resilient materials, such as spring steel or the like, it being important that the material selected have sufficient resiliency to permit the rod to be temporarily deflected a small amount during filter cell holding operations. With hinge-end portion 11 of rod 9 pivotally engaged in the channel formed by bent portion 8 of hinge 7, the remaining portion of rod 9 extends in cantilever fashion, permitting it to be freely moved into and out of the path of the filter cell during loading operations. This remaining portion of rod 9 is constructed to include bearing portion 12, tongue portion 13, and finger grip portion 14. It is to be noted that hinge-end portion 11, tongue portion 13 and finger grip portion 14 of rod 9 all fall substantially within a common plane whereas bearing portion 12 of rod 9 is slightly offset from such common plane for reasons discussed hereinafter. It further is to be noted that bearing portion 12 is contoured to engage against a filter cell 10 in substantially point contact. In this connection, it is to be understood that rod 9 can be so contoured in such a manner along this portion that line contact rather than point contact can be utilized.

As can be seen in FIGURE 2 of the drawings, tongue portion 13 of rod 9 is U-shaped, this tongue portion 13 being so dimensioned that it snugly engages in slot 16 of slotted keeper plate 15 fastened to that side of support frame 2 adjacent the side to which hinge plate 2 is fastened. Slotted keeper plate 15 can be provided with a detent 18 which extends over a portion of slot 16 to keep the U-shaped tongue portion 13 in position after it has been inserted into slot 16.

In order to facilitate the gripping and movement of rod 9, the grip portion 14 is of pigtail contour to permit ready manual handling.

In a typical operation of the latching arrangement described, a unit filter cell 10 is inserted in supporting frame 2 when rods 9 have been pivoted about their hinge-end portions 11 in such a manner that they have been removed from the installation path of the cell. Once the cell is inserted in support frame 2 with the side wall thereof abutting against the gasket 6 on the marginal sealing flange 5, rod members 9 are pivoted inwardly so that offset bearing portions 12 abut in substantial point contact against the other side wall of the cell 10, urging it into sealing engagement against the gasket 6. Since rods 9 are of resilient nature, they can be urged relative hinge-end portions 11 to rest in part against the sides of the support frame with the tongue portions 13 engaging in slots 16 to be held in place by detents 18.

It is to be understood that the present invention is not to be considered as limited to the particular hinge and keeper arrangement disclosed. For example, a suitable hinge can be formed in one side of the supporting frame, itself, and also a suitable slot in the adjacent side. Further, a protrusion from the frame side could be provided about which the U-shaped tongue portion could engage. It further is to be understood that the present invention is not limited to the particular geometrical frame arrangement disclosed but that the inventive latching arrangement can be used in other geometric arrangements and with other types of filter cells. For example, the latching arrangement of the present invention would find par-

3

tical utility with the filter cell arrangement disclosed in assignee's copending application Serial No. 104,200, filed April 17, 1961, under the name of Richard D. Rivers.

The invention claimed is:

1. In an open-ended unit filter cell support frame having a marginal sealing flange disposed therein:
 - (a) an improved latching arrangement for releasably retaining a unit filter cell within said support frame and against said marginal sealing flange comprising:
 - (b) a longitudinally extending latch member pivotally mounted in cantilever fashion at one end to said support frame;
 - (c) said latch member including along its length bearing means, tongue means and grip means; and,
 - (d) keeper means associated with said support frame to receive said tongue means of said latch member;
 - (e) said bearing means of said latch member being offset from said tongue means to engage firmly against a filter cell disposed within said support frame when said tongue means is inserted into said keeper means.
2. In an open-ended unit filter cell support frame having a marginal sealing flange disposed therein:
 - (a) an improved latching arrangement for releasably retaining a unit filter cell within said support frame comprising:
 - (b) a longitudinally extending resilient latch rod pivotally mounted in cantilever fashion at one end to said support frame;
 - (c) said latch rod being formed to include along its length a bearing portion, a tongue portion and a grip portion; and
 - (d) a slotted keeper on said support frame to receive said tongue portion of said latch rod, said bearing portion of said latch rod being offset from said tongue portion thereof to engage firmly against a filter cell disposed within said support frame when said tongue portion is resiliently urged into said slotted keeper.

4

3. In an open-ended unit filter cell support frame having a marginal sealing flange disposed therein:

- (a) an improved latching arrangement for releasably retaining a unit filter cell within said support frame comprising:
 - (b) a hinge member fastened to one side of said support frame;
 - (c) a resilient latch rod having a hinge end portion pivotally engaged in said hinge member and the remaining portion thereof extending substantially normal from and in cantilever fashion from said hinge end portion;
 - (d) said remaining portion of said latch rod being formed to include a grip portion at the free end thereof, a tongue portion adjacent said grip portion and a bearing portion intermediate said tongue portion and said hinge end portion; and,
 - (e) a slotted keeper on a side of said support frame adjacent the side to which said hinge member is fastened to receive said tongue portion of said latch rod;
 - (f) said bearing portion of said latch rod being offset from said tongue portion thereof to engage firmly against a filter cell disposed within said support frame when said tongue portion is resiliently urged into said slotted keeper.
4. The apparatus of claim 3, said tongue portion of said latch rod being of substantially U-shape; and,
 - (a) said slotted keeper including a detent portion extending across a portion of the slot of said keeper to maintain said tongue in engaged position in said slotted keeper.

References Cited in the file of this patent

UNITED STATES PATENTS

1,787,386	Marty	Dec. 30, 1930
2,871,520	Ruda	Feb. 3, 1959
2,920,915	Ducharme et al.	Jan. 12, 1960