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UNIT FILTER LATCH

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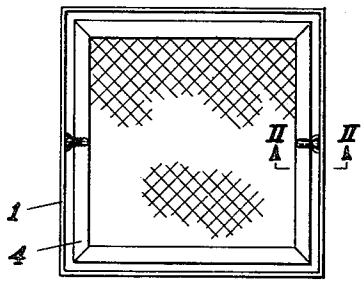


Fig. 1

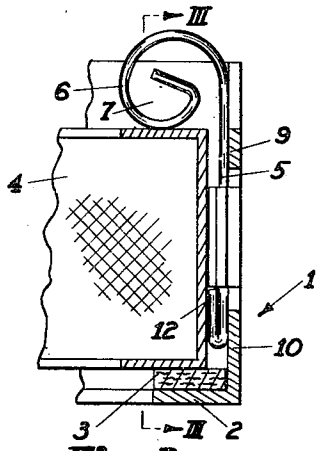


Fig. 2

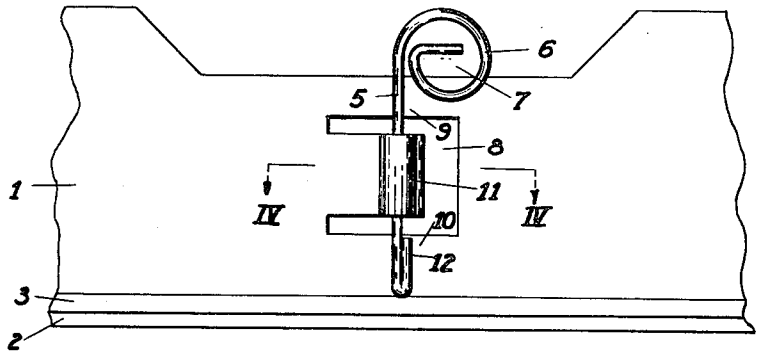


Fig. 3

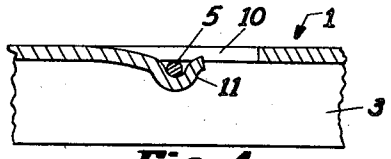


Fig. 4

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UNIT FILTER LATCH

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7 Claims. (Cl. 183—49)

This invention relates to unit filter latches.

The so called "unit filter" comprises: an auxiliary frame having an unobstructed front opening and a marginally flanged rear opening; an air filter cell or panel designed to fit within the frame; and a frame-mounted latch arranged for movement between cell latching and releasing positions and operative, in the latching position, to engage the cell along its front margin and to press it rearwardly into effective air sealing engagement with the rear flange of the frame.

Latch designs have always presented a difficult problem. They should be inexpensive, sturdy, easy to operate and effective in operation. Most, if not all, of the latches heretofore proposed, which have met the foregoing requirements to a reasonable degree, have been of a type having one or more rigidly mounted parts projecting forwardly from the frame. This is objectionable because the forwardly projecting parts increase the shipping space required and are readily subject to damage.

The principal object of this invention is to provide a latch which does not employ any rigidly mounted forwardly projecting parts and which eminently satisfies all other requirements.

Another object is to provide an inexpensive, sturdy, effective and easily operated latch which, in the cell releasing position, lies wholly within the auxiliary frame.

The invention is illustrated in the accompanying drawing wherein:

Figure 1 is a front face view of a unit filter provided with a latch constructed in accordance with the present invention;

Figure 2 is an enlarged section taken along line II—II of Figure 1 showing the latch in latched position;

Figure 3 is a fragmentary section along line III—III of Figure 2 with the latch in the cell releasing position and with the cell omitted; and

Figure 4 is a sectional view taken along line IV—IV of Figure 3.

The drawing illustrates a unit filter which conventionally comprises: an auxiliary metal frame **1** having a front unobstructed opening, a rear flange **2** defining its rear opening and a sealing strip **3** composed of felt or other sealing material adhesively or otherwise suitably secured to the inner face of the rear flange **2**; and a unit filter cell or panel **4** fitting within the frame **1**.

In accordance with my invention, the frame is provided with a pair of latch arms pivotally mounted upon the inner face of opposite walls of the frame **1** for movement from the cell latching positions shown in Figures 1 and 2 to the cell releasing position shown in Figure 3. Each latch arm is in the form of a stem **5** having a laterally extending resilient head **6**. Preferably the latch arm is composed of stiff spring wire having a straight section forming the stem **5** and a spirally bent section forming the head **6** with a finger opening **7**.

The stem is pivotally mounted on the frame for twisting movement about its long axis from a latching position in which the head extends over the filter unit receiving

space of the frame to an unlatching position in which the head extends at one side of that space. While any suitable form of mounting means may be provided, in the means shown, the side wall of the frame is provided with a recess **8** leaving intact side wall portions **9** and **10** above and below the recess and a tongue **11** secured to the frame at one side of the recess to project into the recess between said intact portions. The front end of the tongue **11** is bent slightly inwardly and shaped to provide a stem receiving groove. The tongue presses the stem outwardly so that upper and lower portions of the stem are pressed against the intact side wall portions **9** and **10**.

The inner or lower end of the stem is provided with a stop **12** which limits its outward or upward movement, this stop preferably being formed simply by bending the inner end of the stem back upon itself. The stem is dimensioned and the stop is positioned in such a way as to permit the latch arm, in the unlatched position, to be moved inwardly relatively to the frame so that the arm lies wholly within the frame. When a filter cell is placed in the frame the latch arm is pulled outwardly to the degree permitted by the stop. This is not sufficient to enable the arm to be twisted to its latching position, consequently, the head **6** of the latch arm must now be sprung outwardly and swung over the filter cell. As a consequence, the head, in the latching position, yieldably presses the filter cell **4** inwardly against the sealing strip **3**.

It will be appreciated my latch is inexpensive, effective and easily operated. Furthermore, it is sturdy and not subject to damage in shipment because, when shipped, it may be put into the unlatching position wherein it lies wholly within the frame. In its unlatched position, it permits a cell to be placed within the frame to form a unit and the units to be stacked one upon the other for shipment.

Having described my invention, I claim:

1. An improvement in latches for auxiliary frames of the type having a front opening to receive a filter cell and a rear sealing flange, comprising: a latch arm having a stem and a laterally extending resilient head; and means for pivotally mounting the stem on the frame for twisting movement about the long axis of the stem from a latching position in which the head extends transversely over a portion of the cell receiving space to a releasing position in which the head extends along one side of that space; said resilient head being outwardly springable relatively to the stem from an inner cell-releasing position, toward which the head is biased and in which it cannot clear the cell space when turned toward the latching position, to an outer position, in which it can clear and be moved over the cell space, said head being operable, when moved over the cell space and released, to engage a cell in the cell space and urge it against the rear sealing flange.

2. The improvement of claim 1 wherein: the head is composed of spring wire.

3. The improvement of claim 2 wherein: the spring wire is spirally bent to form the head and a finger opening in the head.

4. The improvement of claim 1 wherein: the mounting means includes a recess in the frame between spaced intact side wall portions of the frame which are adjacent correspondingly spaced inner and outer portions of the stem and also includes a tongue secured to the frame between said intact portions.

5. The improvement of claim 4 wherein: the free end of the tongue extends around the cell side of the stem and presses the stem laterally against the intact portions of the side wall of the frame.

6. An article of manufacture comprising: an auxiliary frame having a front opening to receive a filter cell and a rear sealing flange; a latch arm having a stem and a

laterally extending resilient head; and means pivotally mounting the stem on the frame between the side wall of the frame and the adjacent cell receiving space for twisting movement about the long axis of the stem from a latching position in which the head extends over the cell receiving space to a cell releasing position in which the head extends at least partially into the space between the side wall in which it is mounted and the cell receiving space; said resilient head being outwardly springable relatively to the stem from said cell releasing position, toward which the head is biased and in which it can not clear the cell space when turned toward the latching position, to an outer position, in which it can clear and be moved over the cell space, said head being operable, when moved over the cell space and released, to engage a front margin of the cell in the cell space and urge the cell rearwardly into engagement with the sealing flange.

7. The article of claim 6 wherein: said latch arm can

be slidably moved in the cell releasing position toward the sealing flange to an inner location in which it is positioned wholly within the confines of the frame, the latch arm carrying a stop member which restricts its outward movement to the outer location at which it may be turned toward the cell latching position when its head is outwardly sprung.

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