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H. E. BELSHER

2,408,158

AIR FILTER

Filed Feb. 3, 1944

Fig. 1.

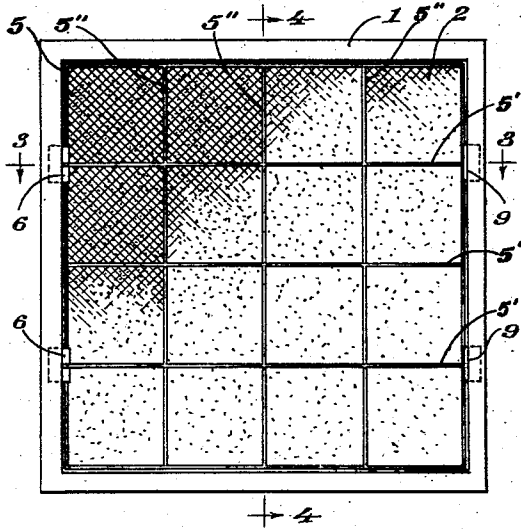


Fig. 2.

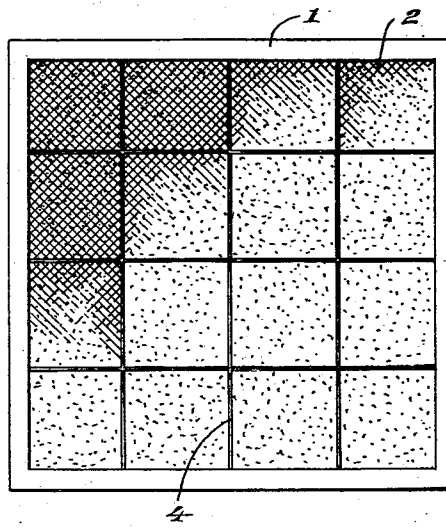


Fig. 3.

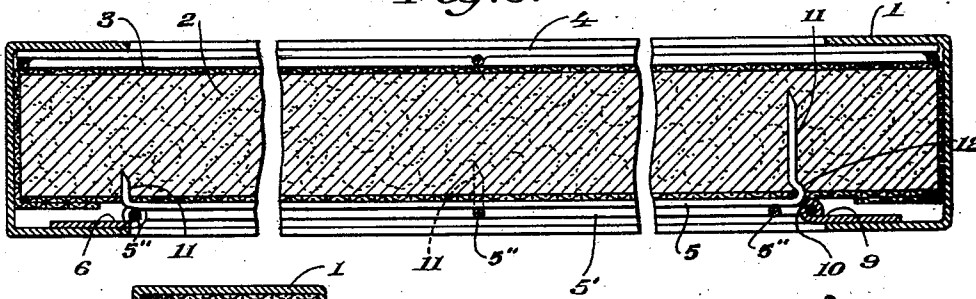


Fig. 4.

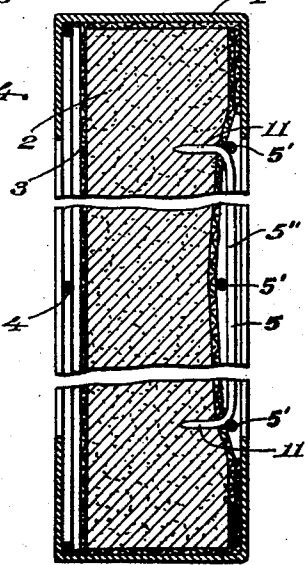


Fig. 5.

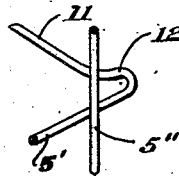
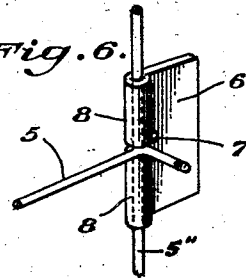


Fig. 6.



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AIR FILTER

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2 Claims. (Cl. 183—49)

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This invention relates to air filters and more particularly to a filter of the type used in connection with air conditioning and circulating systems.

One object of the invention is to provide a filter including a frame adapted to be set in place in an air conditioner of conventional formation and a pad fitting within the frame and adapted to be removed for cleaning or replacement by a new pad when necessary.

Another object of the invention is to provide the frame with a door for its open front, the door being formed of wire strands which have end portions bent to form prongs or spikes which penetrate the pad and prevent the pad from sagging in the frame.

Another object of the invention is to so bend certain of the strands that they form latch-engaging members as well as prongs.

Another object of the invention is to so form and arrange the prongs that they progressively increase in length from the hinged side of the door to the free side thereof, thereby allowing the door to be easily opened or closed and also causing the prongs to so embed themselves in the pad that the pad will be held smooth and flat between the door and a grill or grating at the open back of the frame.

Another object of the invention is to provide an air filter which is simple in construction, easy to install, and capable of having its pad removed when necessary and replaced without removing the frame from the air conditioning unit.

The invention is illustrated in the accompanying drawing wherein:

Figure 1 is a view looking at the front of the air filter.

Figure 2 is a view looking at the back thereof.

Figure 3 is a sectional view taken along the line 3—3 of Figure 1.

Figure 4 is a sectional view taken along the line 4—4 of Figure 1.

Figure 5 is a perspective view of a fragment of the door and illustrating the manner in which latch engaging members are formed.

Figure 6 is a fragmentary perspective view of the hinged side of the door.

This improved air filter has a frame 1 formed of sheet metal and of channelled formation with the flanges presented inwardly to provide the frame with an internal channel about its periphery. By so forming the frame it has rigid sides and top and bottom and is open at its front and at its back, as shown in Figures 3 and 4.

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The pad 2 fits within the frame and is of such dimensions that its marginal portions will extend into the channel of the frame. This pad is formed of suitable absorbent material through which air may pass but dust and other impurities will not pass and is enclosed in an envelope 3 formed of cheese cloth or other fabric of such mesh that it will hold the pad in a compact mass without interfering with flow of air through the pad.

In order to provide a backing for the pad and prevent it from bulging through the open rear side of the frame there has been provided a grill or grating 4 formed from strands of stiff wire which are disposed in crossed relation to each other and soldered together at their points of crossing. This grating fits into the frame and bears against the rear flange thereof and serves very effectively to shield the rear opening of the frame and support the pad so that it is flat and of an even thickness throughout its area.

The front opening of the frame is shielded by a door 5 formed from stiff horizontal strands of wire 5' and stiff vertical strands of wire 5'' which are disposed in crossed relation to each other and soldered at their points of crossing, and in order to mount the door for swing movement to closed and opened positions there have been provided hinges 6. These hinges are formed of sheet metal and the blanks from which they are formed are cut to form slits 7 dividing each blank into upper and lower tongues which are rolled to form sleeves 8 through which a vertical wire strand at the hinged side of the door passes to pivotally mount the door.

At the opposite side of the frame are latches 9 formed of sheet metal plates which are secured against inner surfaces of the outer side flanges of the frame with portions protruding therefrom and rolled to form sleeves 10. End portions of the strands forming the door are bent to form pins or spikes 11 which penetrate the pad when the door is closed, and upon referring to Figure 3 it will be seen that portions of strands forming spikes at the free side edge of the door are bent to form rounded projections 12 which ride over and then engage the sleeves of the latches or keepers and hold the door closed. Since the spikes are embedded in the pad when the door is closed they serve to support the pad in the frame and prevent it from sagging. It should also be noted that the spikes progressively increase in length from the hinged side of the door towards the free side edge thereof, thus permitting the door to be readily closed and the spikes

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easily forced into the pad as the door is closed. After the filter has been used a sufficient length of time for the pad to become dirty and filled with dust and other impurities in air passing through the pad the door can be swung outwardly to an opened position, the pad removed and cleaned and replaced or a new pad fitted into the frame, and the door then closed. It will thus be seen that a pad can be removed and a clean pad set in the frame without removing the frame from an air conditioning apparatus.

Having thus described the invention, what is claimed is:

1. An air filter comprising a frame open at its front and back and having an internal channel about its periphery, a grating mounted in the channeled frame in shielding relation to the rear opening thereof, a pad in said frame bearing against said grating and having marginal portions engaged in the channel of the frame, a door for the open front of said frame formed of strands disposed vertically and horizontally in crossed relation to each other, and having end portions bent to form prongs projecting from the door for penetrating the pad when the door is closed, hinge plates secured to said frame at one side thereof and having portions rolled to form sleeves receiving portions of a vertical

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strand at the adjoining side of the door above and below a horizontal strand and pivotally mounting the door for swinging movement to opened and closed positions, and means for releasably holding the door closed.

2. An air filter comprising a frame open at its front and back and having an internal channel about its periphery, a grating mounted in the channeled frame in shielding relation to the rear opening thereof, a pad in said frame bearing against said grating and having marginal portions engaged in the channel of the frame, a door for the open front of said frame formed of strands disposed vertically and horizontally in crossed relation to each other, and having end portions bent to form prongs projecting from the door for penetrating the pad when the door is closed, hinges at one side of said door secured to said frame and mounting the door for swinging movement to opened and closed positions, and latch plates carried by the other side of the frame, said strands having end portions bent to form prongs projecting from margins of the door for penetrating the pad when the door is closed, and certain of said prongs having portions bent to form projections for engaging the latch plates and holding door closed.

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