Sept. 5, 1939. R. L. KENNEDY 2,171,797

HOT AIR CONDUIT FILTER

Filed Sept. 16, 1938

Fig. 1.

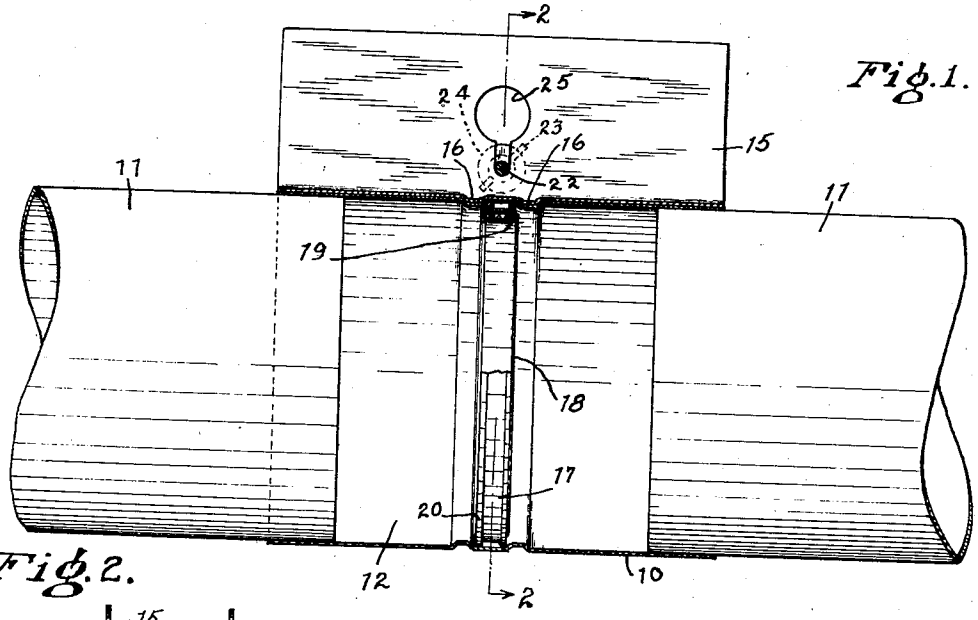


Fig. 2.

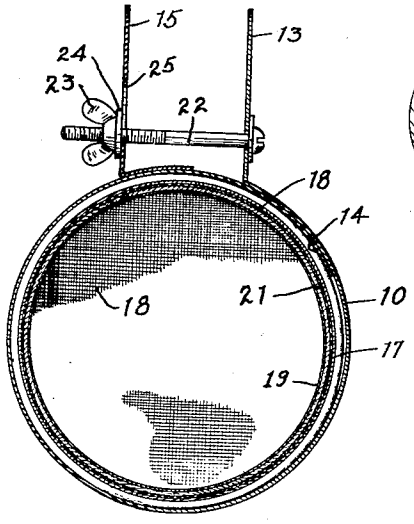


Fig. 3.

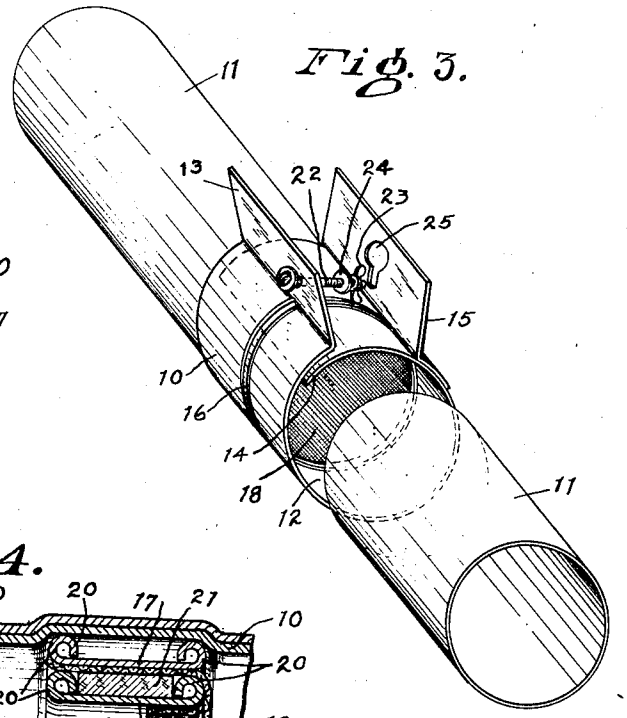
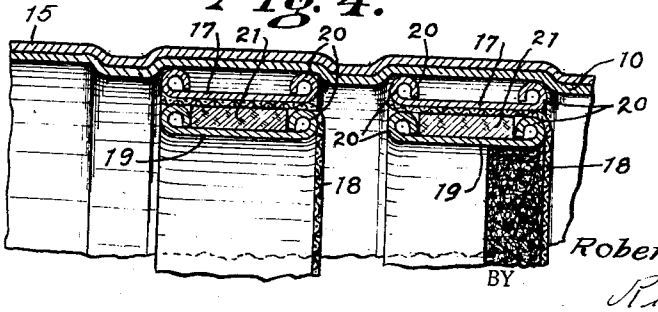


Fig. 4.



INVENTOR.
Robert L. Kennedy.
BY
Richey & Watts.
ATTORNEYS

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HOT AIR CONDUIT FILTER

Robert L. Kennedy, Cleveland, Ohio

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2 Claims. (Cl. 183—74)

This invention relates to filters for hot air furnace conduits and more specifically to an improved screen supporting structure therefor.

One of the objects of the invention resides in the provision of a band or strip adapted to support a filter member and designed for ready affixation upon or removal from the spaced end portions of a furnace pipe or hot air conduit.

Another object of the invention is to provide a filter supporting structure for a hot air conduit which is constructed to facilitate the ready removal of the filter without the use of tools or interruption with the operation of the heating system.

Another object of the invention is to provide a furnace conduit filter which may be readily installed in a heating system which was constructed without provision for an air cleaning medium therein.

A still further object of the invention resides in the provision of a filter which is economic of manufacture, efficient of operation and adapted for general application upon hot air furnace systems of various types.

Other objects and advantages more or less ancillary of the foregoing and the manner in which all the various objects are realized will appear in the following description which, considered in connection with the accompanying drawing, sets forth the preferred embodiment of the invention.

In the drawing wherein the preferred embodiment of the invention is illustrated:

Fig. 1 is a longitudinal section through the improved screen supporting structure, including an elevational view of a fragmentary portion of a pair of aligned hot air conduits and a broken side elevational view of the screen holder frame.

Fig. 2 is a transverse sectional view of the screen and holder shown in Fig. 1, the section being taken on a plane indicated by the line 2—2 in Fig. 1;

Fig. 3 is a view in perspective of the improved filter supporting structure illustrating the manner in which the supporting band is attached to the conduits and the screen frame interposed between the free ends of the axially aligned hot air furnace conduits; and

Fig. 4 is a longitudinal section drawn upon an enlarged scale of a portion of the screen supporting structure and screen frame and illustrating a modified form thereof.

Referring to Figs. 1 and 3, the screen supporting member comprises a split cylinder or band 10 formed to envelop a furnace conduit 11 and bridge a gap 12 formed therein by cutting a section or short length therefrom or adjusting the free ends of a pair of contiguous conduit sections in spaced relation. The band 10 comprises generally a tubular body having an outwardly extended longitudinal flange 13 folded in an edge portion thereof. The inner edge of the band or tongue 14 is disposed slightly beyond the line defining a full convolution of the tube as arranged in operative position upon the conduit. Adjacent the edge of the band forming the tongue 14 there is an angle plate 15 secured upon the outer face of the band and arranged parallel to and in spaced relation with the flange 13. The cylindrical band 10 is constructed intermediate its ends with a pair of spaced beads constituting shoulders 16 suitably spaced for the retention of a ring or annular frame 17 which supports a wire gauze filter plate 18. The gauze or screen 18 is preferably affixed to the ring 17 by use of a second ring 19 constructed to impinge the marginal edge of the screen when two rings are disposed in telescopic engagement. The rings 17 and 19 are preferably formed of light gauge stock having beads 20 rolled in their outer edges to assure their strength and rigidity. If desired, a yieldable gasket or filler strip 21 may be inserted between the gauze and the inner ring to compressively engage the marginal edge portion of the gauze impinged between the rings. The rings and wire gauze constituting the screen frame assembly may be riveted or soldered together to form a unitary structure or may be assembled so that the screen may be replaced without mutilation of the rings.

The flange 13 is apertured for the reception of a bolt 22 which is assembled therein with the headed portion thereof on the outer surface of the flange. The opposed end of the bolt is provided with a wing nut 23 and washer 24, adapted for reentrant engagement within a key hole slot 25 formed in the angle plate 15.

As shown in Fig. 4, the band 10 is formed with an additional bead 26 spaced to provide a shoulder for the retention of the second filter frame of similar configuration to that heretofore described. The cupped portion of either or both of the frame assemblies may be provided with a pad formed of steel wool or fibrous material constituting a secondary filter for arresting the suspended foreign material carried by the air stream in the conduits 11.

In the application of the improved filter to a furnace which has been installed without provision for the improved filter, a narrow section

of the conduit 10 is first cut away preferably from the overlapped end portions of adjoining lengths of the conduit, then with the wing nut and washer released as shown in Fig. 3, the band is sprung apart so that the tongue 14 and flange 13 may be separated a sufficient amount to facilitate the assembly of the strap over the periphery of the conduit 11, the band is next adjusted with the screen frame normal the axis of the cylindrical band between the supporting beads and within the zone or gap defined by the section formerly removed therefrom. With the band and filter frame thus positioned the wing nut and washer are inserted through the key hole slot 25, the bolt lowered to afford locking engagement of the washer with the bottom portion of the slot and the wing nut tightened to draw the band compressively upon the periphery of the ends of the conduits. As the band is tightened upon the conduits the screen frame will likewise be impinged within the tubular walls of the band and crowded against the annular beads therein, thus forming a rigid assembly. Obviously, the supporting frame and filter may be readily removed by reversal of the foregoing operation when it is necessary or desirable to remove the filter for purpose of cleaning or renewal.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. A filter supporting structure for a hot air furnace conduit comprising a spiral band formed to wrap around the periphery of the end portions of a pair of spaced coaxially aligned conduit sections, and constituting a tubular body having a convoluted end portion when assembled thereon, spaced longitudinal flanges on said band, spaced beads in said tubular body intermediate its ends defining shoulders on the inner surface of said tubular body when disposed in assembled relation on the conduit sections, a ring within said tubular body disposed between said beads, a second ring within the first named ring, a wire gauze disc having the circumferential edge thereof impinged between the first and second named rings, a bolt mounted in one of said flanges, the second flange having a slotted aperture therein and a wing nut mounted on said bolt proportioned for reentrant engagement within said aperture and securement by the walls defining the slotted portion thereof.

2. In an air filtering device for hot air furnaces, the combination of a flexible spiral band forming a tubular body having an overlapped convoluted end portion, the ends of said tubular body enveloping the ends of a circulating duct and constituting a part thereof, a longitudinal flange upon said tubular body, an angle plate having a slotted aperture therein secured to the face of the tubular body in spaced parallel relation to said flange, a pair of spaced beads intermediate the ends of said tubular body defining annular ribs on the inner wall thereof, a ring within said tubular body intermediate said annular ribs, a screen disc secured upon said ring, a bolt in said flange, and a wing nut on said bolt adapted for reentrant engagement through said aperture and engaged by the walls defining the slotted portion thereof.

ROBERT L. KENNEDY.