Nov. 29, 1960 S. EPSTEIN 2,962,053

SPACER FOR TRIPLE WALL VENT PIPE

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Fig. 1

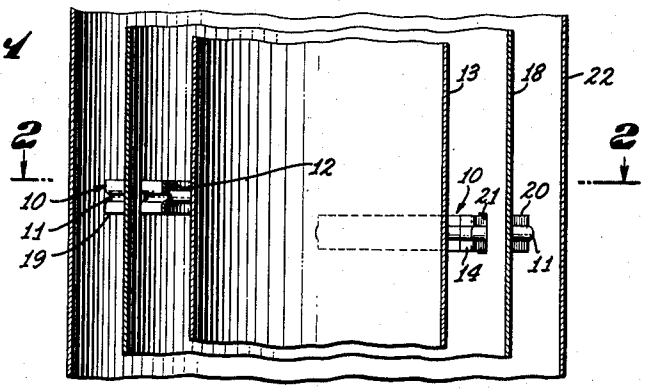


Fig. 2

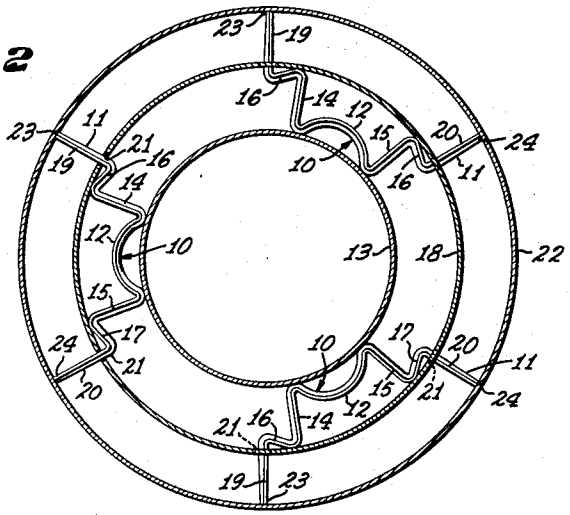
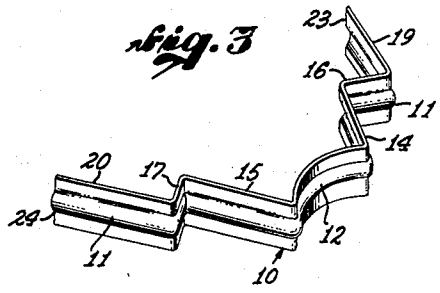


Fig. 3



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SPACER FOR TRIPLE WALL VENT PIPE

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This invention relates to an improved vent pipe spacer construction for multiple, particularly three-walled vent pipes.

The walls of a multiple walled vent pipe are largely maintained in concentrically spaced relationship by spacers which are preferably of light-weight, but strong and stiff construction to securely maintain the spacing between the walls of the chimney or vent pipe construction without adding appreciable weight thereto. Also, the spacers should be designed for efficient, economical fabrication and installation involving a minimum of machinery, labor and time. The spacers should not conduct an appreciable amount of heat from the inner or hot flue gas pipe to the outer wall of the triple wall vent pipe construction to avoid overheating the adjacent building structures. Furthermore, the spacers, once installed, should remain securely in position during and after the installation of the complete vent pipe construction.

Accordingly, in view of the above and other considerations, it is an object of my invention to provide a rugged and secure vent pipe spacer construction designed for rapid and efficient manufacture by the use of low cost mass production methods and without the use of expensive machinery.

Another object is to provide an improved vent pipe spacer construction designed for rapid and convenient installation as well as to afford a strong, secure spaced separation between the three walls of the triple wall chimney or vent pipe.

A further object is to provide a vent pipe spacer construction of light-weight, low material and installation cost which will result in low heat conduction between adjacent walls of the vent pipe assembly and can be factory-installed with facility and accuracy, as part of the prefabricated chimney construction to provide good concentricity of the pipes.

Additional objects will become apparent from the following description.

Stated in general terms, my invention comprehends the provision of a spacer construction derived from a heat-resistant strip of material preferably metal. The strip preferably is beaded in a manner to reinforce and strengthen it so that it will safely withstand forces tending to destroy the desired spacing of the inner and outer walls of the resultant vent pipe from the intermediate wall. Several spacers, preferably three, may be used in about the same horizontal plane around the inner, or flue gas pipe, of the triple wall construction.

Each spacer is formed of a metal strip as follows: A middle bend, preferably an arcuate portion is formed on the strip. Such bend is optionally re-entrant. Also, the radius of the arcuate portion preferably is less than that of the inner, or flue gas pipe of the triple wall vent pipe, adjacent the outside surface of which the arcuate portion is disposed in use. At each end of the arcuate portion, the strip is provided with a portion, directed radially away from the arcuate portion and the inner wall of the vent

pipe. The lengths of these radial portions are approximately equal to the spacing distance between the inner wall and the intermediate wall of the resultant triple-wall pipe.

An offset portion is formed to extend preferably outwardly and laterally from each radial portion and engages, in actual use in the vent pipe assembly, the inside surface of the intermediate wall. Finally, an outer radially directed portion is formed on each offset portion. Said outer radially directed portions are of lengths about equal to the desired spacing between the outer wall and the intermediate wall of the triple wall vent pipe assembly. The positioning of these outer radial portions is such that they can be passed through and preferably wedged into apertures cut through the intermediate wall for mounting the spacers in position.

A more detailed description of a specific embodiment of my invention is given below with reference to the drawing, wherein:

Figure 1 is a vertical sectional view showing a triple wall vent pipe provided with spacers of the type described above;

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1 showing three of the spacers applied to the triple wall vent pipe; and

Figure 3 is a perspective view showing one of the spacers.

Each of the spacers **10** is made of a strip of sheet stock such as #22 gauge aluminized steel. The strip can be of any desired width, optionally, about an inch wide and of suitable length. It can also be formed of wire. Preferably it is provided with a longitudinal and tapered bead **11** of about a quarter inch width and about three-sixteenth inch height. The middle portion **12** is provided with a circular curvature of a radius ordinarily appreciably shorter than that of the inner or flue gas pipe **13** so that the middle portion will be spaced and therefore insulated from the pipe as best shown in Figure 2. The length of the middle portion also is preferably appreciably less than one-third of the circumference of the inner pipe **13** so that a circumferential space will exist between adjacent spacers.

At each end of the middle portion **12** the spacer is bent to form radial portions **14** and **15** which are not necessarily parallel to each other but which preferably diverge somewhat radially of the pipe to impart stability to the final pipe assembly.

At the outer ends of each of the radial portions **14** and **15** are formed offset portions **16** and **17**, respectively. These are advantageously bent at somewhat less than right angles to the radial portions for greater strength and to minimize surface contact with the intermediate pipe **18**.

Finally, the offset portions are each provided with radial portions **19** and **20**, respectively, forming angles of somewhat less than 90° with the offset portions and coinciding with radii of the triple wall vent pipe assembly for maximum strength and rigidity.

The spacers **10** are employed in the triple wall vent pipe structure by first mounting the inner pipe **13** in position. The radial portions **19** and **20** of each spacer then are inserted into slots **21** cut through the wall of intermediate pipe **18** of sufficient height and width to accommodate the spacer ends, preferably with a tight fit due to said tapering of the ends **19** and **20** and/or their beads **11**. A pair of slots **21**, spaced the proper distance horizontally are therefore cut through the wall of pipe **18** for each spacer for such purpose. Two of the three pairs of slots preferably are positioned at about the same horizontal level but at least one pair, i.e. the third pair, are somewhat staggered for greater ease of installation.

In use, the spacers **10** are mounted in the wall of the intermediate pipe **18**, the two pair on the same level being

inserted with the intermediate pipe off center, then these pipes are partially telescoped and pulled to center them while the third spacer is inserted and the pipes further telescoped and secured concentrically. The intermediate pipe **18** is thus positioned around inner pipe **13**.

The spacers **10** will not fall out of their positions because the offset portions **16** and **17** bear tightly against the inside surface of intermediate pipe **18** and the tapered ends **19** and **20** wedge firmly in their slots as stated.

The outer pipe **22** then is placed in position over the intermediate pipe **18** with the ends **23** and **24** of the radial portions **19** and **20**, respectively, bearing against the inside surface of outer pipe **22**, as best shown in Figure 2. Each section of the triple wall vent pipe is built up in this manner until the entire length thereof is assembled. It will be apparent that this can be accomplished rapidly by a relatively unskilled workman in one short assembly period with relatively low labor and materials cost.

While I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures can be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent structure.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Spacer strip for three concentric pipes comprising a central portion adapted to bear against the outside of the innermost of said pipes, a pair of first spacer portions extending from the respective ends of said central portion generally radially with respect to an axis representing the center of said pipes, a pair of second spacer portions extending, respectively, generally radially with respect to said axis parallel to said first spacer portions and adapted to pass through respective apertures in the intermediate of said pipes and to bear against the inside of the outermost of said pipes, and a pair of abutment means, respectively, between said first and second spacer portions and adapted to bear against the inner surface of the intermediate of said pipes.

2. A spacer for three concentric pipes comprising: a central portion adapted to bear against the outside of the innermost of said pipes, a pair of first spacer portions extending from opposite ends of said central portion generally radially with respect to an axis representing the center of said pipes, the ends of said first portions being adapted to bear respectively against the inner surface of the intermediate of said pipes, a pair of offset portions extending from the ends of said first portions, and a pair of second spacer portions extending respectively generally radially with respect to said axis and laterally from said offset portions and adapted to pass through respective apertures in the intermediate of said pipes and bear against the inside of the outermost of said pipe.

3. A spacer for three concentric pipes comprising a strip having an arc intermediate its ends formed outwardly with respect to an axis representing the axis of the concentric pipes in which the strip is adapted to be installed, a pair of first portions extending from the ends of said arc portion and generally radially outward of said axis, the ends of said first portions being adapted to bear respectively against the inner surface of the intermediate of said pipes, a pair of offset portions extending from the ends of said first portions and a pair of second portions extending from the ends of said offset portions generally radially outward with respect to said axis and adapted to pass through respective apertures in said intermediate pipe and bear against the inside of the outermost pipe, said strip being provided with a longitudinal reinforcing bead extending at least along said second portion and tapering down outwardly to provide a wedging action in the aperture in the intermediate pipe, said arc being smaller in radius than the innermost of said three pipes.

4. Three concentric pipes and spacer means therefor in combination comprising: three concentric pipes, a first spacer portion bearing against the outer surface of the innermost of said pipes, a second spacer portion passing through an aperture in the intermediate of said pipes and bearing against the inside of the outermost of said pipes, and abutment means between the first and second spacer portions and bearing against the inner surface of the intermediate of said pipes.

5. Three concentric pipes and spacer means therefor in combination comprising: three concentric pipes, a spacer strip having a central portion bearing against the outside of the innermost of said pipes, a pair of spacer portions extending generally radially outward from the ends of said central portion, a pair of second spacer portions passing through respective apertures in said intermediate pipe and bearing against the inside of said outermost pipe, and abutment means between said first and second spacer portions bearing against the inside of said intermediate pipe.

6. Pipe assembly comprising: three concentric pipes, a spacer strip having a central portion bearing against the outside of the innermost of said pipes, a pair of first spacer portions extending outwardly from the respective ends of said central portion and bearing against the inside of the intermediate of said three pipes and an outer portion, offset from said inner portion, and passing through apertures in said intermediate pipe and bearing against the inside of the outermost of said pipes.

7. Pipe assembly comprising: three concentric pipes, a spacer strip having an arc intermediate its ends formed outwardly with respect to the axis of said pipes, the ends of said arc bearing against the outside of the innermost of said pipe, a pair of first portions extending from the ends of said arc portion generally radially outward of said axis, the ends of said first portions bearing against the inner surface of the intermediate of said pipes, a pair of offset portions extending from the ends of said first portions, and a pair of second portions extending from the ends of said offset portions generally radially outward of said axis and passing through respective apertures in said intermediate pipe, and bearing against the inside of the outermost pipe.

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