March 28, 1961 W. S. NEWBILL 2,976,797

CHIMNEY CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 1

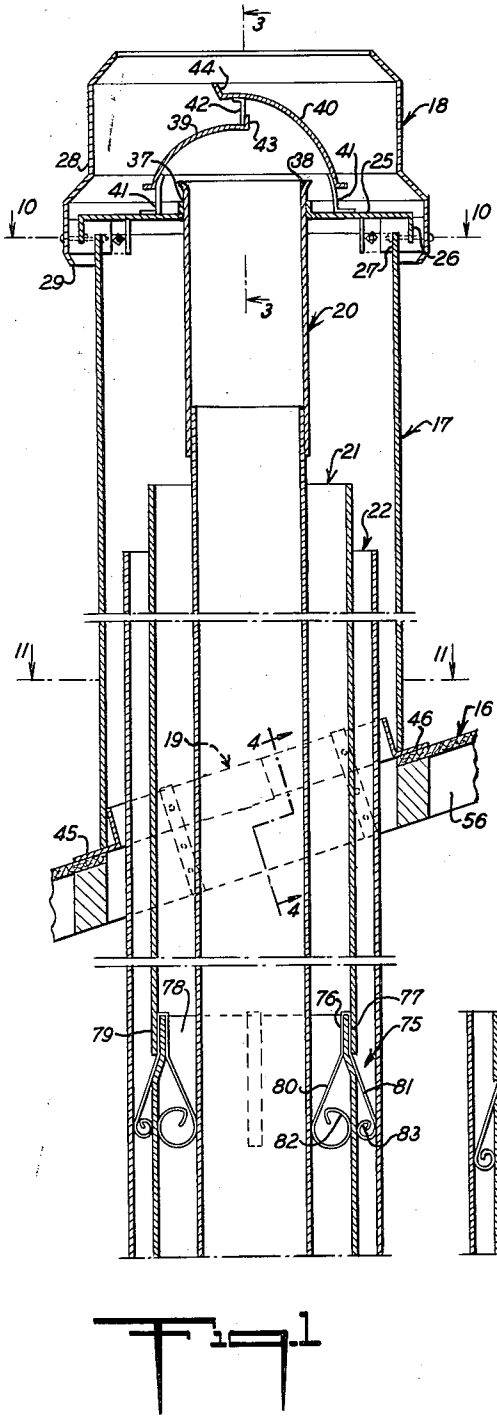


FIG. 1

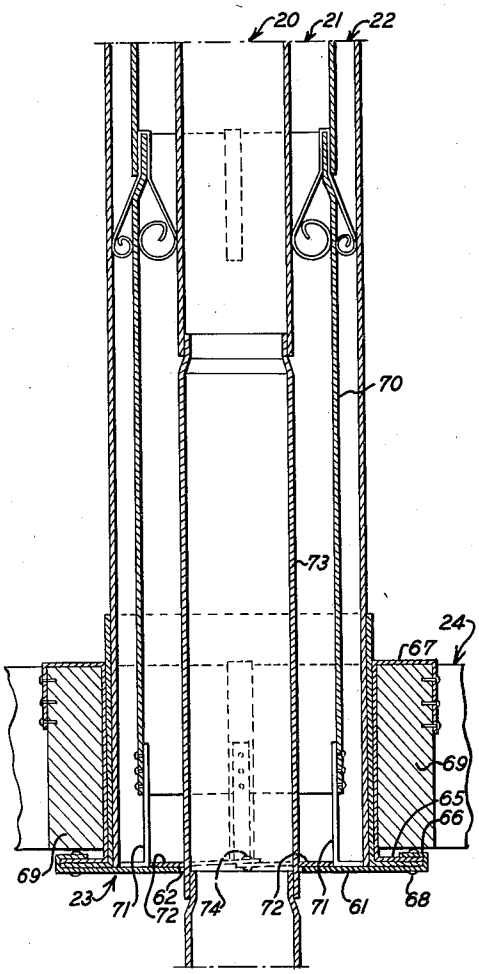


FIG. 2

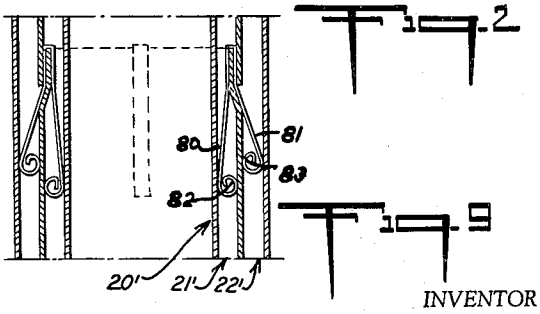


FIG. 9

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March 28, 1961 W. S. NEWBILL 2,976,797

CHIMNEY CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 2

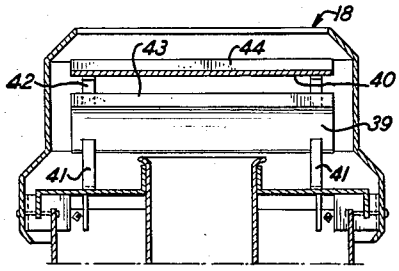


Fig. 3

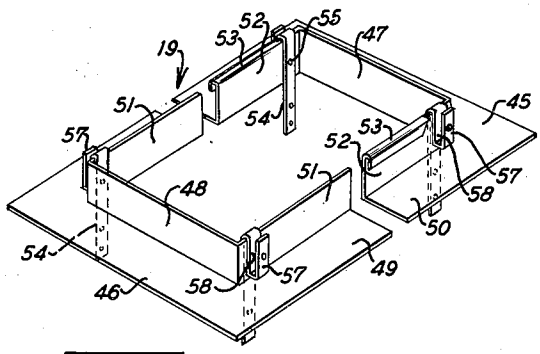


Fig. 6

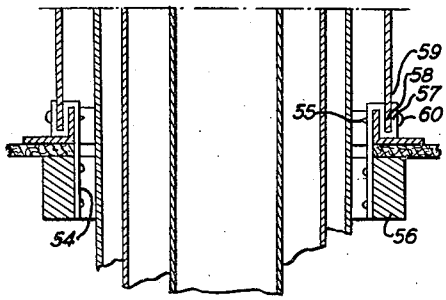


Fig. 4

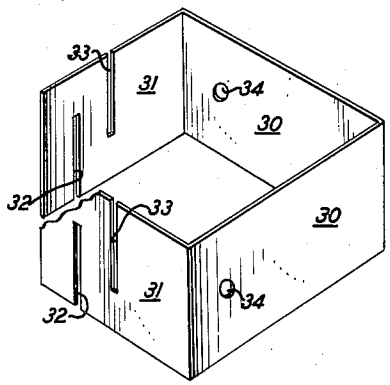


Fig. 7

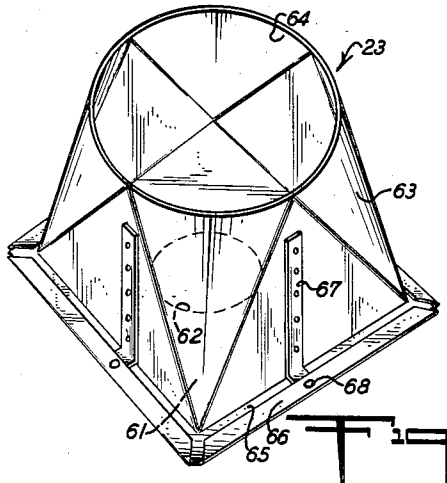


Fig. 5

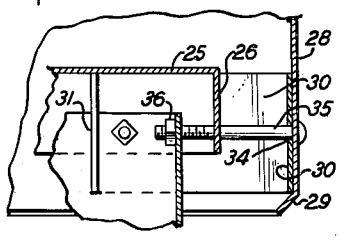


Fig. 8

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March 28, 1961 W. S. NEWBILL 2,976,797

CHIMNEY CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 3

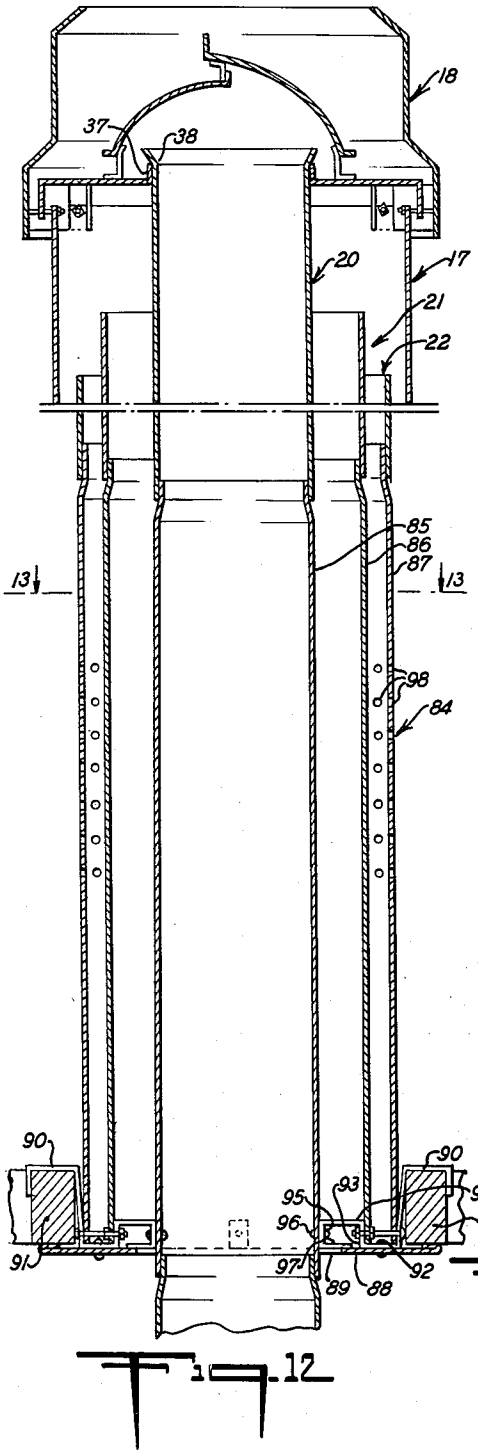


FIG. 12

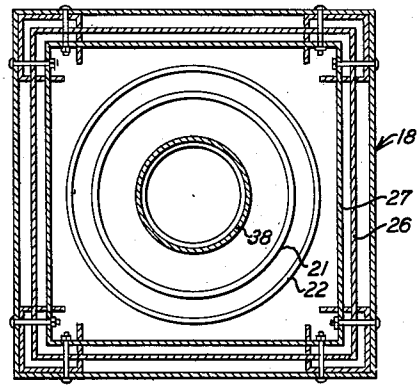


FIG. 10

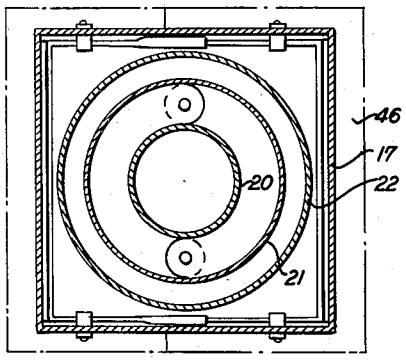


FIG. 11

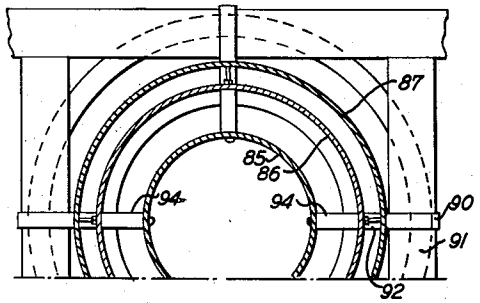


FIG. 13

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March 28, 1961 W. S. NEWBILL 2,976,797

CHIMNEY CONSTRUCTION

Filed Sept. 22, 1958 4 Sheets-Sheet 4

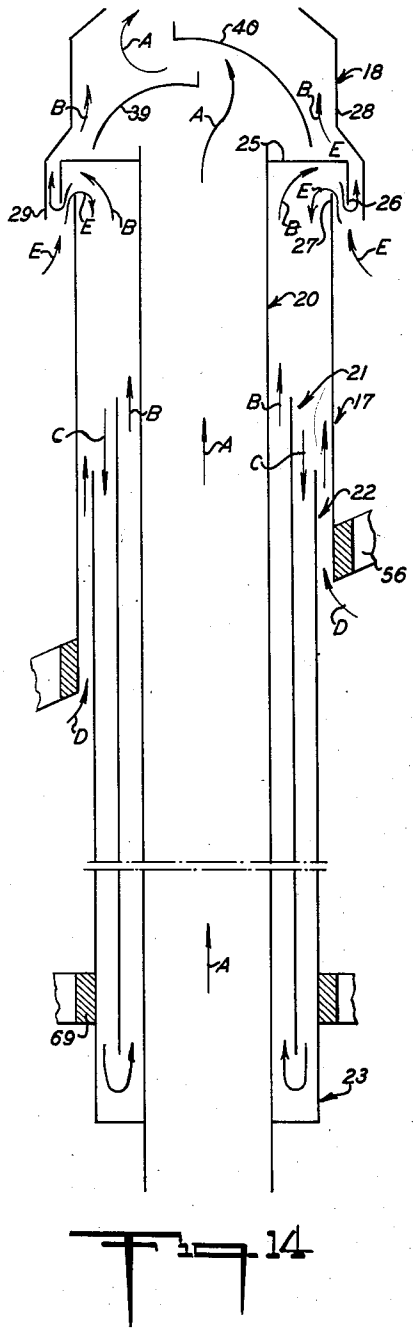


Fig. 14

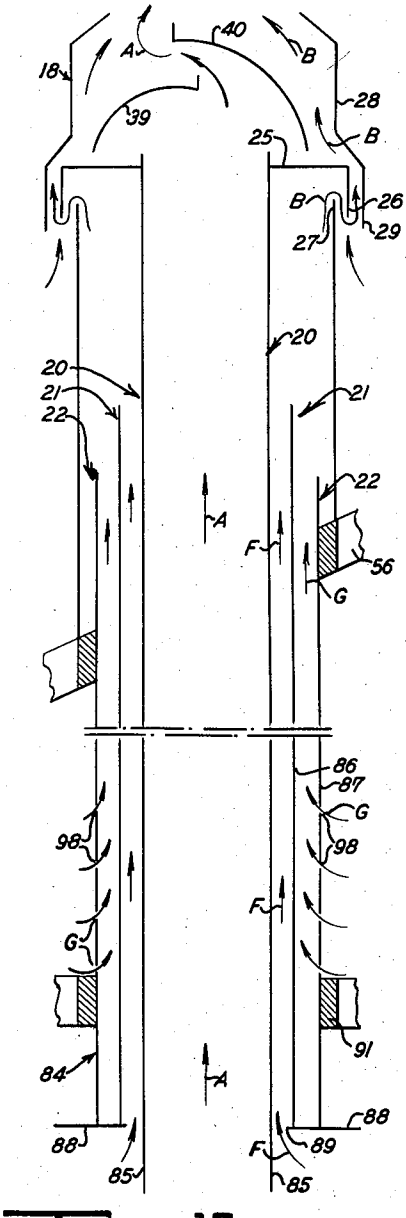


Fig. 15

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2,976,797

CHIMNEY CONSTRUCTION

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Filed Sept. 22, 1958, Ser. No. 762,448

14 Claims. (Cl. 98—84)

This invention relates to chimney construction, and more particularly to the type of chimney that is prefabricated from sheet metal sections.

Generally, chimneys of this type comprise a central flue for hot gases of combustion which is surrounded by one or more additional ducts spaced outwardly from the central flue to provide a passage, or passages, for a surrounding blanket of insulating air.

Due to the flow of air in the outer passages, a rapid and efficient dissipation of heat from the central flue is possible and, consequently, the ductwork, including the central flue and the surrounding insulating air passages, may be fabricated entirely from sheet metal sections. Furthermore, so efficient is the arrangement, that it is not necessary to space the outer ductwork away from the usual combustible building materials such as the wood framework of an ordinary house. In fact, in the case of the usual home heating unit it has been found by experiment that even with the heating unit running continuously at capacity it is possible to put one's hand on the outermost insulating casing without discomfort.

Certain of these pre-fabricated chimney structures employ a counter current flow of insulating air in which case the cooling air is admitted near the top of the structure to the outermost surrounding passage. Communication is established between the outer passage and an intermediate passage at the bottom of the structure and the air admitted at the top thus flows downwardly and into the intermediate passage at the lower end of the chimney structure. Since the air in the intermediate passage is in heat exchanging relationship with the central flue, the air in the intermediate passage will flow upwardly and is released at the top of the chimney structure.

In the type of structure using counter current flow of insulating air the lower ends of the insulating air passages, while being in communication one with another, are substantially closed to the atmosphere. However, it has been found by experiment that entirely adequate insulation may be attained when the air flows concurrently upwardly in each of the surrounding insulating air passages which will be the case when one or more of the air passages is open to the atmosphere at some point below the upper outlet.

From the standpoint of practical manufacturing efficiency it is usually preferable to fabricate the flue, or smoke pipe, and the surrounding ductwork comprising the air passages from tubular sections of sheet metal of various diameters to be installed one within the other in generally spaced concentric arrangement.

And, while such an arrangement of exposed conduits projecting vertically into the air would operate satisfactorily, in the case of a dwelling house aesthetic considerations usually require that some form of enclosure, preferably resembling a brickwork chimney, should be placed on the roof to conceal it. Such an enclosure may also be utilized to prevent the entry of rain or snow into the ductwork.

The roof enclosure is preferably fabricated from sheet metal, although other materials may be used. From a utilitarian standpoint, the enclosure must provide several functions. It must provide an outlet, usually at the top, for the hot products of combustion from the central flue. An opening, or openings, must be provided at some point usually near the upper portion of the enclosure, for the discharge to the atmosphere of the heated air from the insulating duct, or ducts. In some cases a space is provided around the outside of the outermost insulating duct to enable air from the attic of the building to vent through the enclosure to the atmosphere. In the case where the insulating ducts are arranged for counter current flow of air, this air must usually be supplied from the outside atmosphere through some suitable opening in the enclosure which may also be the same opening through which the heated insulating air is vented. In addition to these functions the enclosure must protect the various flues and conduits from the physical effects of the elements such as wind, hail, snow, and so forth.

Some difficulty has been experienced with prefabricated chimneys, particularly where the smoke flue terminates below the level of the upper outlet in the top cap portion of the enclosure, in that the smoke tends to blow against the inner sides of the top cap and down the outside walls of the enclosure which results in a short time in forming a deposit of soot which, on the outside of the enclosure is unsightly, and creates a dangerous fire hazard when deposited on the interior. In the present construction such deposits are prevented by a novel arrangement which provides for the upward circulation of what might be called a "blanket" of clean air interposed between the discharging combustion gases and the surface of the enclosure.

Another feature of the present invention is to provide a novel form of rain shield for the smoke flue which does not interfere with the smoke flow and is entirely concealed below the top cap of the enclosure.

Another object is to provide an enclosure for the outlet of a smoke pipe having provision for inducing an annular current of clean air surrounding the gases from the smoke flue so as to prevent the deposit of combustion solids on the enclosure.

A further object is to provide a means for mounting a pre-fabricated chimney enclosure on a roof, including adjustable flashing, which will firmly secure the enclosure to the roof structure itself.

Another object is to provide an improved base mounting structure for pre-fabricated sheet metal chimneys.

Another object is to provide an improved form of spacing means for positioning a plurality of sheet metal conduits one within another.

Other objects, including certain improvements in details of construction and assembly of sheet metal structures, will be apparent after reading the foregoing specification in connection with the annexed drawings, in which:

Figure 1 is a cross-sectional elevation of the upper portion of one form of chimney structure embodying the present invention;

Figure 2 is a cross-sectional elevation of the lower portion of a chimney structure comprising a downward extension of the structure shown in Figure 1;

Figure 3 is a cross-sectional elevation of the top cap structure shown in Figure 1 and taken at right angles thereto along the line 3—3 of Figure 1;

Figure 4 is a fragmentary cross-section taken on the line 4—4 of Figure 1 and showing details of construction of the adjustable roof mounting for the enclosure;

Figure 5 is an isometric view of the base supporting structure shown in cross-section in Figure 2;

Figure 6 is an isometric view of the adjustable roof

mounting for the enclosure but with the two interfitting sections; separated from each other;

Figure 7 is an isometric view on a greatly enlarged scale of one of the corner brackets used to assemble the top cap and upper enclosure;

Figure 8 is a vertical cross-section also on a greatly enlarged scale showing a portion of the corner assembly including the bracket shown in Figure 7;

Figure 9 is a fragmentary vertical cross-section, similar to a portion of Figure 1, illustrating the operation of the adjustable spacer members;

Figure 10 is a horizontal cross-section taken on the line 10—10 of Figure 1;

Figure 11 is a horizontal cross-section taken on the line 11—11 of Figure 1;

Figure 12 is a vertical cross-section of the modified form of chimney construction;

Figure 13 is a horizontal cross-section taken on the line 13—13 of Figure 12;

Figure 14 is a schematic diagram of the flow path of air and gases in the chimney construction shown in Figures 1 and 2; and

Figure 15 is a schematic diagram of the flow path of air and gases in the chimney construction shown in Figure 12.

Referring now to the drawings in detail, there is shown in Figures 1 and 2 a preferred embodiment of the invention in which the numeral 16 indicates generally the roof of a building or other structure having a suitable opening therein for an exteriorly upwardly projecting chimney, the exposed portions of which comprise a rectangular sheet metal casing 17 surmounted by a top cap 18, secured to the roof structure by means of the flashing indicated generally by the numeral 19.

Concealed within the casing 17 and extending downwardly into the building are a series of generally concentrically arranged conduits which may include a flue or smoke pipe 20, an intermediate air conducting conduit 21, and an outer air conducting conduit 22. The smoke pipe 20 is connected at its lower end with the outlet of any conventional heating device (not shown) based in the basement or a utility room within the building for the purpose of conducting the products of combustion into the atmosphere outside the building. The purpose of the intermediate, and outer, air conducting conduits 21 and 22 is to dissipate the heat generated by the central flue 20 and to accomplish this result they are spaced outwardly from the flue and from each other and terminate at their lower ends at a base mounting means, indicated generally at 23. This base is most conveniently mounted in a suitable opening provided in the ceiling, indicated generally at 24, in the basement of a building if the heating device is located below the ground floor or, if the building is a ranch style dwelling, the heating unit may be installed in a utility room on the ground floor level in which case the ceiling 24 will also comprise the floor of the attic space.

In order to protect the interior of the casing 17 and to prevent the entry of wind and rain, the top of the casing is surmounted by a horizontally disposed rain shield 25, preferably fabricated from sheet metal, having a downwardly extending peripheral flange 26. The dimensions of the downward flange 26 are such that if the lower edge may project slightly below the upper edge 27 of the casing and spaced outwardly therefrom on all sides and also to permit the rain shield 25 to be spaced above the upper edge 27 of the casing to permit the free passage of atmospheric air into and out of the casing 17. In addition, while the side walls 28 of the top cap are shown in the drawings as having an irregular shape in vertical cross-section, the particular form chosen is preferable for ornamental reasons and the purposes of the invention would be served if some other form were used, it being important only that the wall 28 of the top cap be spaced outwardly from the peripheral flange 26 of the rain shield and, preferably, that the lower margin 29 of the side wall projects somewhat below the bottom of the flange 26 to provide an air passage extending peripherally around the exterior of the casing 17 in communication with the interior of the top cap shield 25. The top cap 18, including the rain shield 25, are positioned and supported in proper spaced relationship on the casing 17 by means of corner brackets, one of which is shown in detail in Figure 7.

Each of these brackets comprises an elongated strip of sheet metal which is bent at its center at right angles to provide the two sides 30 which fit against the inside corners of the sidewalls 28 of the top cap, the ends 31 being again bent inwardly at right angles to the sides 30. Near the end of each of the projecting portions 31 a slot 32 is cut upwardly from the lower margin to receive the upper edge 27 of the casing 17. Each of the ends 31 is also provided with another slot 33 extending downwardly from the upper margin to receive the downwardly extending flange 26 of the rain shield. A hole 34 is also punched in each of the sides 30 to receive a long bolt 35 which also extends through suitable openings provided in the sidewalls 28 of the top cap, the downward flange 26 of the rain shield and the upper edge 27 of the casing and is drawn up tight at its inner ends by means of a nut 36, as shown in detail in Figure 8.

In the center of the rain shield 25 a circular opening is provided surrounded by an upstanding collar 37 having a water tight connection with the rain shield, which collar is adapted to receive the upper end of the smoke pipe 20. The upper end of the smoke pipe may, if desired, be rolled outwardly to form an annular bead 38 so that at least a portion of the weight of the smoke pipe may be supported by the rain shield 25. A pair of semi-cylindrically shaped wind deflectors 39 and 40, having their axes disposed horizontally, extend transversely across the opening for the smoke pipe with their lower edges supported above the level of the rain shield, as by means of the sheet metal strips 41 riveted thereto, while the upper edge of the deflector 41 is spaced above the upper edge of the deflector 39 in slightly overlapping relationship by means of the riveted spacer strips 42. The upper edge of the deflector 39 terminates in an upstanding flange 43, while a similar flange 44 is provided at the upper edge of the deflector 40, both of these flanges acting as rain guards to prevent the entry of water into the flue.

The adjustable flashing 19, which supports the casing 17, comprises a pair of generally U-shaped sheet metal elements 45 and 46, the inner margin thereof being provided with upstanding flanged portions 47 and 48 respectively. The width of the opening defined by the inner margin of sheet 46 will be slightly larger than the corresponding opening in sheet 45 so that when the sheet 45 is used to enclose the lower side of an opening in a sloping roof, as in Figure 1, the depending leg portions 49 of the upper sheet member 46 may overlie the upwardly extending leg portion 50 of the lower sheet 45 and the lower projecting portion 51 of flange 48 may slidably engage the outer space of each of the projecting flange portions 52 of the lower sheet. In order to furnish a more rigid structure the upper margin of the flanges 52 may be extended outwardly and downwardly to form channels 53 within which the upper edges of flanges 51 will be slidably received. After the flashing assembly 19 has been adjusted for the sides of the opening in the roof it is permanently secured thereto by means of metal straps having downwardly projecting portions 54 which are riveted, as at 55, to the insides of the projecting flanges 51 and 52. These straps are then secured to the rafters 56, for example by being nailed thereto as shown in Figure 4, or by other suitable means. The upper ends of these straps extend over the top edge of each of the flanges 51 and 52, then downwardly over the outer spaces thereof and, finally, terminate in an upwardly

projecting portion 57 which forms with the portion 58 a saddle within which is received the lower edge 59 of the casing 17. A sheet metal screw 60 can be used to secure the casing to the flashing, as shown in Figure 4, this screw preferably being long enough to extend through the three overlapped sections of the metal straps as well as the lower edge of the casing and the flange of the flashing.

The base mounting means 23 is formed of a sheet metal and comprises a rectangularly shaped bottom plate 61 having a central opening 62 through which the lower end of the flue 20 may project joined to an upwardly projecting shroud 63. The upper end of the shroud terminates in a circular opening 64 which receives the lower end of the outer air conducting conduit 22, while the lower end of the shroud preferably terminates in a rectangular outline having an outwardly projecting peripheral flange 65 for engagement with the outer margin 66 of the bottom plates which are bent up and crimped over the flange. The sheet metal supporting strap 67 has its lower end inserted between the overlapping crimped margins 66 and the peripheral flange 65 and are firmly secured as by means of rivets 68.

The base mounting means is most conveniently located at the ceiling in the space where the furnace is to be located. For example, if the furnace is located in the cellar the base can be located between adjacent floor joists 69 of the first floor of the building so that the supporting straps 67 may be bent over the top of the joists and nailed to the outside faces thereof as shown in Figure 2. In this manner the base serves as the principal support for the outer air conducting conduit 22, the lowermost portion of which forms a substantially air tight connection with the circular opening 64 of the base mounting and whose bottom edge may rest on the bottom plate 61. Similarly, the lowermost section 70 of the intermediate air conducting conduit may be supported with its lowermost edge spaced above the bottom plate by means of a sheet metal strip 71. Since the smoke pipe 20 extends through the opening 62 normally no support would be given to it by the base mounting, but by providing a pair of semi-circular clamping strips 72 to encircle the exterior of the lowermost section 73 and by securing their overlapping ends by means such as the rivet 74 a firm support for the smoke pipe can be provided as is also shown in Figure 2.

One of the features of the invention is the provision of adjustable spacing means for the various flues and conduits which makes it possible to use smoke pipes of widely varying diameters without the necessity of changing the outside dimensions or construction of the assembly as a whole. These spaces, indicated generally by the numeral 75, comprise an elongated strip of springy sheet metal which is doubled back upon itself near its midsection to provide two closely spaced oppositely disposed parallel portions 76 and 77 which may be clipped over the upper lip 78 of each of the sections 70 of the intermediate air conduit, the outer section 77 of the spaces extending downwardly flat against the conduit for a distance at least sufficient to allow the lower lip 79 of the adjacent section of conduit to be slipped into its proper engaging position. The lower ends 80 and 81 diverge outwardly and terminate, respectively, in inwardly turned convolute portion 82 and 83, respectively the angle of the diverging portions and the diameter of the convolutions being such that the lower end 80 will press firmly against the outside of the smoke pipe while the lower end 81 will bear similarly against the inside of the outer air conduit 22 and at the same time the convolute portions 82 and 83 will press resiliently against the respective inner and outer surfaces of the intermediate air conduit 21.

The effect of changing the diameter of one of the conduits is shown in Figure 9, in which case the smoke pipe 20' is of somewhat greater diameter than that of the smoke pipe 20 shown in Figure 1, while the respective diameters of the air conduits 21' and 22' are the same as those of conduits 21 and 22. It will be seen in Figure 9 that the spaces 75 have accommodated themselves to this change in dimensions by a reduction in the radius of the convolute portion 82 and an increase in the length of the lower end 80 to compensate therefor.

In Figures 12 and 13 there is shown a modified form of base mounting means indicated generally by the numeral 84. In this modification the casing 17, top cap 18, and the arrangement of the smoke pipe 20, and the air conducting conduits 21 and 22 are the same as in the construction previously described. The base 84 comprises essentially three concentrically spaced tubular sections of sheet metal 85, 86 and 87 which may, in actual practice, each consist of a single section of the sheet metal type used in the fabrication of the flue 20, the intermediate air conduits 21 and the outer air conduits 22, respectively. In contradistinction to the base 23, previously described, in the present modification both of the air conducting conduits 86 and 87 terminate at their lower end in abutting relationship with a horizontal base plate 88. This plate is provided with a central opening 89 which is of substantially greater diameter than that of the smoke pipe 85, the lower end of which may project slightly below and spaced concentrically within said opening by means of the sheet metal brackets 90. These brackets also support the base, as in the modification previously described, by having their upper ends nailed, or otherwise attached, to the floor or ceiling joists 91 from which they may extend downwardly along the outside of the outer tubular section 87. The bottom of the bracket is bent inwardly at right angles to provide an outer spacing portion 92. The bracket is then bent upwardly at right angles to provide a vertically offset portion 93 from the upper end of which the bracket is bent at right angles again to provide the inner spacing portion 94, while this spacing portion terminates in a downward offset 95 which may be secured to the outside of the pipe 85, as by rivets 96. The downward offset 95 is preferably formed with the outwardly extending horizontal link portion 97 which may rest on the surface of the base plate 88.

In this form of construction, since the intermediate section 86 extends completely down to the base 88 and forms a substantially air tight connection therewith, the flow of insulating air in the concentric passage defined by the outer section 87 would otherwise be cut off but for the fact that a large number of holes 98 may be punched, or otherwise formed, in the outer section to admit air into the passage from the exterior of the base.

In operation the path of flow of the insulating air currents in the form of chimney construction shown in Figures 1 through 11 is illustrated diagrammatically in Figure 14. The arrows A indicate the outward flow of products of combustion through the flue 20 and upwardly past the wind deflectors 39 and 40 passing upwardly into the atmosphere through the center of the opening in the top cap 18. Since the temperature of the flue will be considerably higher than that of the surrounding atmosphere, it follows that the transfer of this heat to the air immediately surrounding the flue and confined between it and the intermediate air conduit 21 will be induced to move in an upward direction as indicated by the arrows B. Since the lower end of the conduit 21 is in communication only with the space between it and the outer air conducting conduit 22 and, since the temperature of the conduit 21 will be less than that of the flue 20, it follows that a downward flow of air will result in the outer passage defined by the conduits 21 and 22 indicated by the arrows C. It will be obvious that in order to maintain a proper temperature differential between the flue 20 and the outer conduit 22 there must be a continual supply of air to the conduits 21 and 22 at atmospheric temperature and this air can be furnished either from within the building or from the exterior, or both. In the present instance, some of this air is supplied from

the attic space through the opening between the rectangular walls of the casing **17** and the tubular conduit **22**, as indicated by the arrows D. The remainder of the fresh air will enter the casing through the space at its top between the upper edge **27** and the downwardly extending flange **26** as indicated by the arrows E. Turning back now to the flow of heated air, it will be seen that the means of escape for this air is also through the space between the flange **26** and the upper margin **27**. However, since the air indicated by the arrows B is warmer than the fresh air entering the casing, indicated by the arrows E, this heated air will tend to remain on top and also, when it passes outwardly from under the flange **26**, to flow in an upward direction through the annular space defined by the lower margin **29** of the top cap and the flange **26**. Furthermore, the upward path of the air flow B will extend over the inside surface of all four walls of the top cap until it finally escapes to the atmosphere. The result will be that the smoke A passing upwardly through the central portion of the top cap will be completely surrounded by the air flow B which comprises substantially nothing but clean heated air which will act, in effect, as a form of blanket between the walls of the top cap and the smoke to effectively prevent any soot or cinders which may be in the smoke from coming in contact with the top cap or depositing on the surfaces thereof.

In the modified form of the invention using the base mounting as shown in Figures 12 and 13 the air flow pattern is diagrammatically illustrated in Figure 15. This type of construction is especially adapted for use in single story dwellings where it is often customary to place the furnace in a utility room on the same floor as the living quarters. In this case the base mounting for the chimney **84** is preferably suspended from the ceiling joists **91** so that openings **98** are located about the level of the ceiling. As in the previous modification the upward draft of products of combustion from the furnace are indicated by the arrows A passing upwardly through the central tubular section **85** and into the flue **20**, then upwardly between the wind deflectors **39** and **40** and into the atmosphere through the top of the top cap **18**. Due to the fact that the central opening **89** in the base plate **88** is of substantially larger diameter than the pipe **85**, the heat radiated by the smoke in the pipe **85** will cause a current of fresh air to be drawn up through this central opening between the pipes **85** and **86** and continuing upwardly through the connecting passage formed between the flue **20** and the intermediate conduit **21** into the space between the flue and the chimney casing **17** as indicated by the arrows F. Since there is no communication between the space defined by the sections **86** and **87** and the space defined by section **86** and the pipe **85**, and since a certain amount of the heat from the pipe **85** will be transmitted to the pipe **86**, the air contained between the sections **86** and **87** will necessarily become warmed to a certain extent causing it to move upwardly also as indicated by the arrows G while additional air will be supplied to this space through the holes **98** from the attic space between the ceiling and the roof. Once the currents of air indicated by the letters F and G have entered the space in the casing **17** they will join and continue upwardly to pass out of the casing over the upper edge **27** and below the flange **26** of the rain shield **25** as before. Similiarly, this air will be trapped by the lower margin **29** of the top cap and thus be directed upwardly to form a blanket of clean air within the sidewalls **28** to completely surround the column of smoke issuing from the flue **20**.

While the foregoing description is illustrative of several embodiments of the invention, it should be understood that the invention may take other forms which will be obvious to those skilled in the art within the scope of the following claims.

I claim as my invention:

1. In a chimney construction, a vertically extending outer casing adapted to enclose an opening in a roof, said casing terminating at its upper end in a peripheral margin disposed in a horizontal plane, an imperforate rain shield having a horizontally disposed peripheral margin, means to support the rain shield to position the peripheral margin of the rain shield spaced above the peripheral margin of the casing to provide a peripheral opening therebetween adjacent the upper end of the casing, said rain shield having an opening to provide a substantially air tight connection with a flue means extending vertically upward through the interior of the outer casing and terminating at its upper end above the rain shield, a top enclosure open at the top and bottom adapted to surround the flue outlet and having a lower horizontally extending peripheral margin of a greater dimension than that of the rain shield, and means to support said top enclosure to position said lower margin of the top enclosure spaced peripherally outwardly of the margin of the rain shield.

2. The invention as defined in claim 1, wherein the vertical walls of said casing terminate at the upper edge in a horizontal plane, said rain shield being spaced above said upper edge to provide said peripheral opening in the casing, said peripheral margin of the rain shield having a downwardly extending flange whose lower margin is spaced outwardly from the walls of said casing.

3. The invention as defined in claim 1, wherein the upper edge of the wall of said casing terminates below said rain shield to provide said peripheral opening, and the lower margin of said top enclosure extends below the horizontal margin of said rain shield.

4. The invention as defined in claim 3, wherein the lower margin of said top enclosure also extends below the upper edge of said casing.

5. In a top enclosure construction for a flue, means to support a horizontal rain shield having an opening for said flue, and a pair of horizontally disposed rectangular sheet metal wind deflectors spaced above and extending across said opening, means to support said deflectors, each of said deflectors being of arcuate configuration in vertical cross-section and having one straight edge of each disposed one on each side of said opening spaced above said rain shield, the opposite margin of each deflector being arranged in overlapped space relationship one above the other above said opening, a generally rectangular sheet metal structure having a pair of vertical oppositely disposed sheet metal walls and means to support said rectangular structure to position said opposite walls to extend from below said opening to a level above said deflectors spaced outwardly from the open end thereof.

6. The invention as defined in claim 5, wherein the upper edge of each of said deflectors is provided with an upwardly extending flange to prevent water from being blown down into said flue opening.

7. In a building construction for a roof having an opening to be enclosed by an upwardly projecting exterior sheet metal chimney housing of rectangular horizontal cross-section, a pair of cooperating flashing sheets, portions of one sheet being adapted to overlie portions of the other sheet, said sheets being cut out to provide a rectangular recess centrally disposed of said overlapped sheets, the three sides of the recess thus formed in each sheet being provided with upwardly extending flanges, the opposite parallel flanges of one flashing sheet being arranged to mate with the opposite parallel flanges of the other flashing sheet and to be slidably disposed on the outer sides thereof, one pair of said parallel flanges being provided with downwardly extending lips to slidably engage with the upper edges of the other pair of flanges, and a pair of elongated metal straps attached to each of said flashing sheets, one strap to each of said oppositely disposed flanges, each strap extending over the upper edge of the flange and down the opposite sides

thereof, the outwardly disposed end of said strap being turned upwardly to provide a U-shaped saddle to receive the lower edge of a sheet metal chimney housing, the inwardly disposed end of said strap extending below said flashing sheet to be secured to the interior of the roof construction.

8. In a spacer for sectional thin-walled tubing having telescopically interengaging end joints, said tubing being concentrically disposed within an outer conduit and also enclosing an inner conduit concentrically disposed therewithin, an elongated flat strip of flexible metal the ends of which terminate in reentrantly curved portions, a medial portion of the strip extending longitudinally through the joint between two interengaging sections of said tubing, whereby one end of said strip is disposed between said tubing and the outer conduit and the other end between said tubing and the inner conduit, the radius of curvature of said reentrant portions being slightly greater than the radial distance between the respective conduits and the tubing, whereby said end portions each resiliently bridges the space therebetween.

9. The invention as defined in claim 8, wherein the medial portion of the strip is doubled back upon itself to provide a portion which closely engages with opposite sides of the end of one of said tubular sections.

10. The invention as defined in claim 9, wherein the ends of said strip diverge outwardly from said doubled back medial portion to bear respectively against said inner and outer conduits, the reentrantly curved portion being disposed to bear respectively against the inner and outer surfaces of said sectional tubing.

11. In a supporting base for sheet metal chimneys, a horizontal rectangular base plate, a vertical tubular shroud having an integral horizontally outwardly flanged lower margin co-extensive with the margin of said base plate, said base plate having an integral inwardly turned flange overlying the flange on the shroud, a pair of vertical sheet metal supporting straps disposed on opposite outer sides of said shroud, the lower ends of said strap being received within said inwardly turned flange and secured thereto, a central opening being provided in said base plate to receive a vertical smoke pipe, the upper end of said shroud being adapted to receive a vertically extending outer tubular conduit, and an intermediate vertical section of thin-walled conduit to be disposed between said smoke pipe and said outer tubular conduit, and means to position the lower edge of said intermediate conduit above said base plate.

12. In a supporting base for prefabricated sectional sheet metal chimneys, a horizontal sheet metal base plate having a central opening, three sections of sheet metal tubing of progressively greater diameter disposed concentrically with respect to said central opening and extending vertically above said base plate, and a pair of elongated sheet metal supporting straps extending vertically upwardly from said base plate and secured thereto on opposite sides of the outermost of said tubular section, said opening in the base plate having a diameter greater than that of the innermost tubular section and less than that of the next progressively larger tubular section, the bottom of both the outermost and intermediate tubular section being disposed to abut flush against the base plate, the outermost section being provided with an air inlet opening intermediate of its length, and the lower ends of said supporting straps being formed to provide three vertically extending horizontally spaced portions in alignment with the respective surfaces of said concentrically spaced tubular section; said sections being secured to said vertically extending spaced portions of said straps.

13. The invention as defined in claim 12, wherein the bottoms of both the outermost and intermediate tubular sections abut flush against the base plate, and the outermost section is provided with an air inlet opening intermediate of its length.

14. The invention as defined in claim 12, wherein the lower ends of said supporting straps are formed to provide three vertically extending horizontally spaced portions in alignment with the respective surfaces of said concentrically spaced tubular section, said section being secured to said vertically extending spaced portions of said straps.

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