United States Patent [19]

Prezewalski

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[54] **CHIMNEY**

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[52] **U.S. Cl.** **138/113,** 138/148, 98/60

[51] **Int. Cl.** **F16l 9/18**

[58] **Field of Search** 138/113, 112, 111, 138/148; 285/140, 142, 143; 98/60, 58; 52/218, 219

[56] **References Cited**

UNITED STATES PATENTS

2,714,395 8/1955 Epstein 138/113

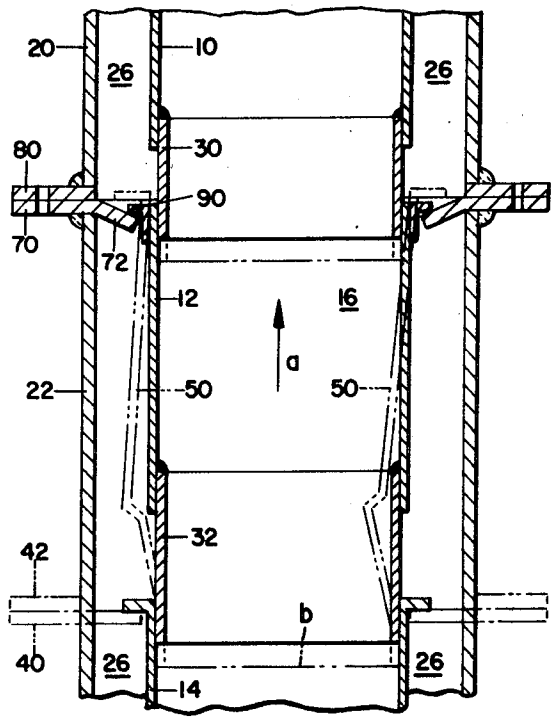
2,759,491 8/1956 Everhart ..... 138/148 X

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[57] **ABSTRACT**

A chimney formed from a plurality of modular sections and defining a central annulus-shaped passage as a flue and an outer surrounding air or insulating passage formed by a pair of concentrically arranged inner and outer walls with compensating means allowing for dimensional changes in the walls of the modular sections resultant from temperature variations.

5 Claims, 2 Drawing Figures



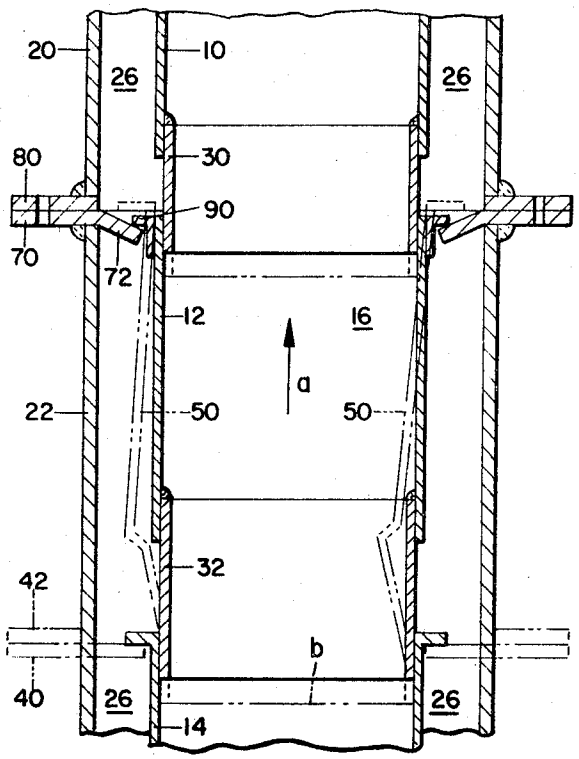

20
26
10
26
80
30
90
70
72
12
16
a
22
50
50
32
42
b
40
26
26
14

FIG. 1.

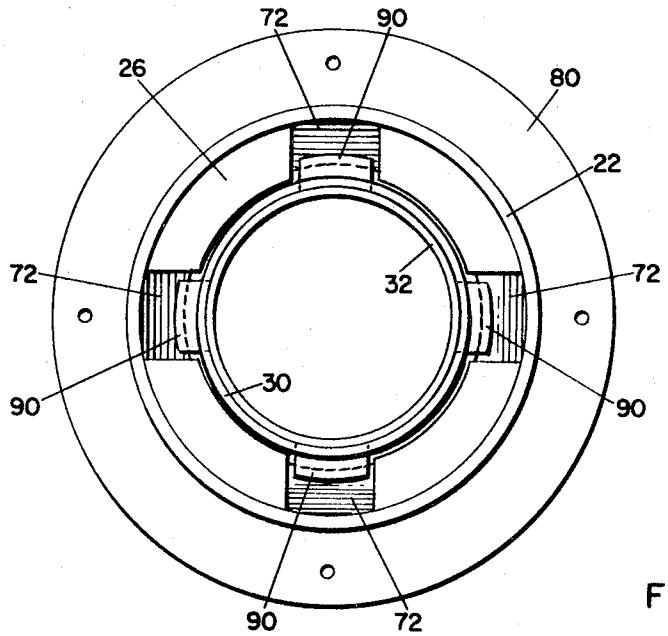

72
90
26
80
22
72
32
72
90
30
90
90
72

FIG. 2.

CHIMNEY

The invention relates to a tubular stack of modular sections having means for compensating for dimensional changes resultant from temperature variations in operational use.

In stack design exploiting the use of metal tubes, problems inherent in tube expansion and contraction are common, necessity dictating that such expansion and contraction be allowed, yet without allowing the development of leaks or eccentricity of the originally concentric tubes.

In known stacks, normally made of an elongated tube and circumadjacent lining, the tube expands under conditions of high flue gas temperature and shrinks to a loose fit within the lining when that temperature is lowered.

Frequently in such cases, the gap between the tube and lining often grows on the wind side in degree different from the gap on the down wind side, all so as to allow the production of tube warpage.

According to this invention, the design teaches the use of pairs of thin-wall tubes, which tubes are held concentrically with respect to each other irrespective of the degree of expansion or contraction of the separate members.

The outer tube is provided with flange lugs which are radially arranged therearound and inclined downwardly and inwardly toward the longitudinal axis of the stack, and the inner tube has matching radially arranged flange lips which are extendable substantially horizontally and outwardly from the inner tube and are seatable upon the lugs of the outer tube.

Between the concentric outer and inner tubes either an air passage or a high temperature resistant lining may be employed as the insulation means.

The invention readily allows a modular design lending itself to an easy installation of a series of inner tubes with insulation lining along the hot part of the stack cooperant with a series of outer tubes, all to the end that the unitary stack may be erected to any desired height.

In the drawing:

FIG. **1** is a fragmentary vertical sectional view through a diametrical center of the stack of the invention; and

FIG. **2** is a view in top plan through the stack of FIG. **1** with the topmost outer and inner tubes thereof being removed for purposes of simplification.

A series of inner tubes **10, 12** and **14,** preferentially of stainless steel, are installed, in seriatim, one above another, and in coaxial alignment with respect to each other.

Such inner tubes **10, 12** and **14** define an interior passageway **16** through which the hot flue gases flow centrally of the stack and in the direction of arrow *a*.

Inner tubes **10, 12** and **14** are installed concentrically within coaxially aligned outer tubes **20, 22,** which outer tubes are preferentially formed of galvanized steel.

The passageway **26** between the series of inner tubes and series of outer tubes defines a surrounding air passageway around the inner tubes through which surrounding air may flow or be entrapped by the closing off of the opposite ends and/or an insultaing passageway in which a liner of insulating material may be disposed around the inner tubes.

Extension tubes **30, 32** are telescopically related to and are strategically welded to inner tube **10, 12** respectively so as to allow the tight insertion of extension

tube **30** into inner tube **12** and of extension tube **32** into inner tube **14,** as the case may be.

Inner tube **12** and its cooperant extension tube **32** expand downwardly to the plane indicated by the daah line *b* at high temperature.

Conventionally, a flange **40** of the usual design, and depicted in dash lines because it is conventional, would be bolted to a mating flange **42** so as to force inner tube **12** and extension tube **32** to warp such as shown by dash lines marked **50** toward the cooler, wind-exposed side of the stack, assumed in the exemplification to be on the left side of the drawing.

The outer tubes might follow this warping trend so as to further weaken the stack and jeopardize the lining or trappped air within area **60** between the inner and outer tubes.

To allow for the expansion of inner tubes **10, 12, 14** and extension tubes **30, 32,** and at the same time to maintain the concentricity of these tubes with respect to outer tubes **20, 22,** the outer tubes are provided with uppermost outwardly facing peripheral flanges **70** and inwardly facing downwardly inclined lugs **72** and also with lowermost outwardly facing peripheral flanges **80.**

Lugs **72** are matched peripherally as to spacing and number with horizontally and radially extending flange lips **90** which are provided adjacent the uppermost edge of and the outside wall surface of each of inner tubes **10, 12, 14.**

In the exemplification, four of such inclined lugs **72** and four of such lips **90** are shown, although it is to be understood that any number of coacting lugs and lips may be employed so as adequately to support the weight of the inner tubes.

When the flange lips assume a position indicated by **90'** by virtue of the expansion of the inner tube, they are then allowed to seat upon the incline of their respective lugs **72,** so as to keep the inner tube centered within the outer tube.

Flange **70** with its lugs **72** may be, for the sake of convenience, formed not as a full or complete ring but as a plurality of ring segments with one or more lugs being cut into the segments and then offset as to plane before the welding of segment to tube.

I claim:

1. In a metal stack comprising: pairs of outer and inner tubes, the outer tubes having on their upper edges peripheral lugs inclined downwards toward the longitudinal center axis of the stack, the inner tubes having radially matching flange lips extending radially outward from the upper edges of the inner tubes and resting on the respective lugs of the respective outer tubes.

2. In the metal stack, as set forth in claim **1,** wherein the lugs of the outer tubes are cut out from and bent off a flange of these tubes, which flange is made and welded on in segments.

3. A modular metal stack comprising: a plurality of coaxially aligned outer and inner tubes concentrically arranged as to each other, the outer tubes having peripheral lugs inclined downwardly relative to the longitudinal center axis of the stack, and the inner tubes having radially extending flange lips projecting outwardly and resting on the mating lugs of the outer tubes.

4. The metal stack, as set forth in claim **3,** with the lugs of each outer tube being cut out and bent from a flange of the tube formed in segments and welded to the outer tube.

5. A chimney in the form of a metal stack comprising: modular pairs of concentric outer and inner tubes, the outer tubes having peripheral lugs, inclined downwardly with respect to the longitudinal center axis of the stack and the inner tubes having matching radial flange lips extending outwardly, with each lip resting on a respective lug.

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