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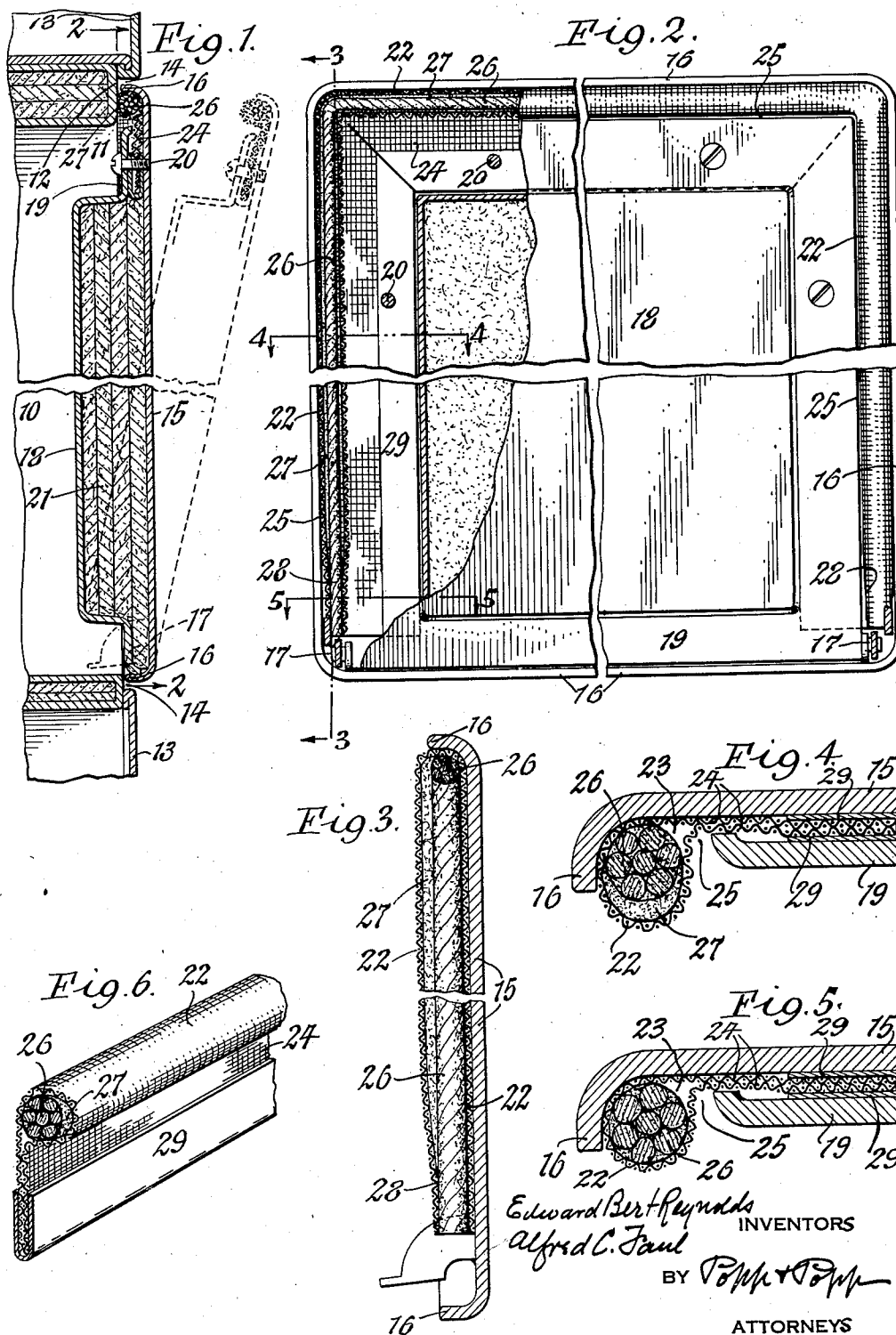
E. B. REYNOLDS ET AL

2,219,962

GASKET

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2 Sheets-Sheet 1



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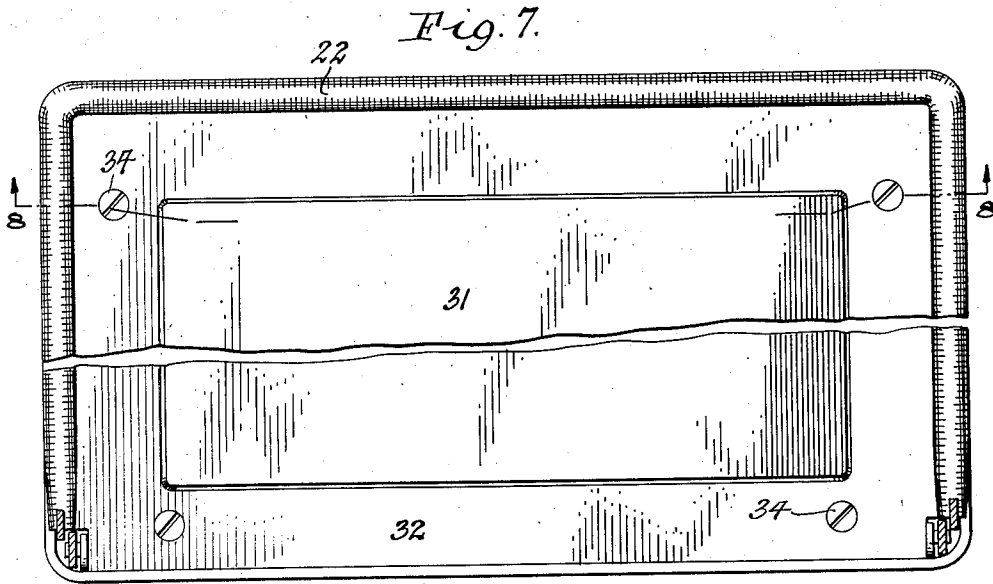
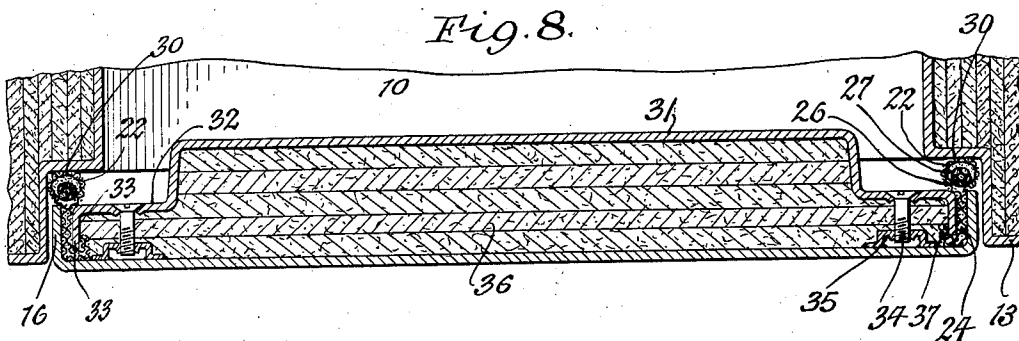
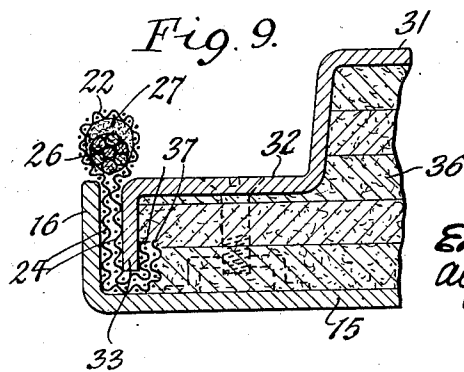
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2 Sheets-Sheet 2



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GASKET

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2 Claims. (Cl. 20—69)

This invention relates to a gasket which is more particularly designed for sealing or packing the joint between the bake oven of a stove around the inlet opening thereof and the edge of the door which is hinged to the oven and adapted to move toward and from the same for covering and uncovering said opening, although this gasket is also capable of use in other installations where similar conditions exist.

In baking stoves, particularly those which are electrically heated, it is difficult, if not impossible, to secure a uniform engagement of the edge portion of the door with that part of the oven wall adjacent to the edge of its inlet opening through which the material is introduced into and removed from the oven and as a result hot vapors and gases leak out of the oven, past the joint between the oven wall and the door when the latter is closed. This is objectionable not only on account of the loss of heat and a waste of fuel, but it is also undesirable in that the hot vapors and gases escaping from the oven produce a discoloration or staining of the oven around the opening and the door and therefore impair the neat appearance of the same.

It has also been found that in the case of ash pit doors for furnaces which do not fit each other accurately drafts of air are not shut off fully so that the fire in the furnace is not under control and cannot be checked effectively by excluding air.

In case of large chimneys having covers for clean-out openings therein, it has also been difficult to maintain a tight joint between these covers and the frames around the chimney openings to prevent drafts which otherwise reduce the effectiveness of the chimney.

In annealing and hardening furnaces it is also difficult to maintain a tight joint between the doors and the chambers containing the material under treatment.

It is therefore the object of this invention to provide a gasket for use between a chamber around an opening therein and a closure which is adapted to cover and uncover this opening which produces a tight, non-leaking joint therebetween and effectively prevents the passage of gases, vapors or the like through such joints notwithstanding that the opposing bearing surfaces of these members are not absolutely accurate and thus enable an oven to be heated quicker, avoid discoloration of the same in the case of a baking stove, also prevent leakage of air into the ash pit in the case of a furnace to permit of controlling the fire, also to prevent leakage of air

into a chimney so as to avoid interfering with its draft and also correct similar conditions in other installations of a like character, such as the doors of annealing furnaces.

In the accompanying drawings:

Fig. 1 is a fragmentary vertical section showing this invention applied to a stove, this section being taken vertically through the length of the door of the stove and the adjacent part of the front wall of its baking oven and showing the door by full lines in its closed position, and by dotted lines in its open position.

Fig. 2 is a vertical section taken parallel with the front side of the stove and on line 2—2, Fig. 1 and showing part of the lining on the inner side of the door broken away.

Fig. 3 is a vertical section taken on line 3—3, Fig. 2.

Figs. 4 and 5 are fragmentary horizontal sections, on the correspondingly numbered lines in Fig. 2, and on an enlarged scale, showing the formation, respectively, of the filling of the gasket at a point remote from the door hinge and at a point near to this hinge.

Fig. 6 is a fragmentary perspective view of a portion of the preferred form of this gasket detached from the stove door.

Fig. 7 is a fragmentary elevation of a stove oven door viewed from the inner side thereof and showing a modification of this invention.

Fig. 8 is a horizontal section, on an enlarged scale, taken on line 8—8, Fig. 7.

Fig. 9 is a fragmentary horizontal section similar to Fig. 8 on a still larger scale in order to show the form of the gasket and the manner of mounting the same on a door.

In the following description similar characters of reference indicate like parts in the several figures of the drawings:

Although this invention can be used advantageously for sealing or packing the joint between two relatively movable members so as to produce an air, gas or vapor tight joint therebetween, the same is shown in Figs. 1—5 of the drawings, as an example of one of the various uses of this invention, between the bake oven of a stove and its door whereby the inlet of this oven is covered and uncovered. This stove as there shown comprises a bake oven or chamber adapted to receive the food to be baked and provided at its front end with an inlet opening or passage through which the food to be baked is introduced into and removed from the oven and which is surrounded by a bearing surface, and an upright wall which forms part of

the stove frame or housing across the front end of the bake oven and provided with an opening 14 which registers with the inlet 11 of the bake oven. This inlet is covered and uncovered by a door which is movable into and out of a position across the front end of the oven and comprises an upright metal panel or frame 15 which has its marginal or edge portions overlapping the bearing surfaces 12 of the bake oven and provided with a rearwardly or inwardly projecting marginal flange 16 adapted to engage with or to be arranged close to this bearing surface. This door may be movably mounted on the bake oven in any suitable manner so as to permit of opening and closing the same, this being accomplished by means similar to those now in common use and including a pair of hinges 17 which connect the door adjacent to opposite ends of its lower horizontal edge with the lower front part of the bake oven so that those parts of the door above its hinges can be moved toward and from the inlet of the oven.

On its inner side the oven door is provided with heat insulating lining means in order to protect the same from the effects of the heat of the oven and prevent the panel of the door from becoming warped. The protecting means for this purpose shown in Figs. 1, 2 and 3 of the drawings are well known and comprise a sheet metal liner or plate which is arranged on the inner side of the door panel and dished inwardly to form a central flat shield 18 and a marginal flange 19 secured by means of screws 20 to the adjacent marginal parts of the door panel. The shield 18 of the liner and the panel 15 of the door are spaced from each other so as to form a pocket therebetween which receives a filling 21 of asbestos or similar material which operates as a heat insulator for preventing the door panel from becoming unduly heated.

The gasket forming the subject of this invention and used in connection with the bake oven and door of the stove shown in Figs. 1-6 of the drawings is constructed and operates as follows:

Mounted on the inner side of the door panel along its upper horizontal free edge and its upright vertical edges is a strip of woven wire which is folded so as to produce an outer tube 22 having a slot 23 lengthwise on one side thereof and two inner flanges or flaps 24, 24 extending laterally from said tube on opposite sides of the slot 23 thereof. This woven wire strip is so mounted on the inner side of the door that the same, as a whole, has the shape of an inverted U, the legs of which are arranged respectively in the upright channels or gaps 25 formed on the inner side of the door between the vertical portions of its marginal flanges 16 and the adjacent vertical flanges 19 of the liner, while the upper crosspiece of this U-shaped strip of woven wire is arranged horizontally in the channel or gap 25 arranged on the upper part of the door between the upper horizontal portion of its flange 16 and the adjacent upper horizontal edge of the liner flange 19.

The flanges of the vertical and horizontal portions of this folded woven wire strip preferably engage each other and are arranged respectively between the vertical and upper horizontal portions of the liner flange 19 and the adjacent vertical edge portions of the door panel and are clamped between the same by the screws 20 which secure the liner to the panel of the door.

The wire from which this gasket strip is woven may be constructed of any suitable material but

preferably of a wire which has some resilience, such as copper wire. This woven wire strip of the gasket is preferably coated with material which will prevent the same from being discolored by the vapors or gases which are produced within the bake oven during the cooking operation and which come in contact with this woven wire, thereby preserving a neat and finished appearance of this gasket. Protection against discoloration of the wire of the woven strip may be obtained by coating the same with tin, zinc or other non-tarnishing material.

Upon closing a door carrying this woven wire strip, the upper horizontal portion thereof which is arranged farthest from the hinges of the door engages with the upper horizontal part of the bearing surface of the bake oven above the inlet thereof while the vertical parts of this woven wire strip engage with the vertical parts of the bearing surface of the oven inlet and thereby operate to seal or pack these parts of the joint between the bake oven and door so as to prevent leakage of hot vapors, gases, air or steam through this joint from the interior of the oven to the exterior of the same. Upon opening the door the resilience of the wire of which the strip is woven operates to again restore the tubular part of this strip to its normal condition.

Inasmuch, however, as this woven wire has only a limited amount of resilience, and this resilience is liable to be reduced by heat during the cooking operation, a resilient fibrous filling is placed in the tubular part of the woven strip so that the same together with this tube virtually forms an elastic bead along the upper horizontal and vertical edge portions of the door. Upon engaging this resilient bead with the upper horizontal and vertical edge portions of the bake oven the same will not only form a leak-tight joint between these parts but the bead will also expand to its normal condition when the compression of the same is removed upon opening the door. This gasket therefore enables the joint between the door and oven to be effectively sealed notwithstanding the frequent opening and closing of the door which occurs during successive cooking operations.

Although this filling in the tube of the woven wire strip may be varied in character, it is preferable to utilize for this purpose an inner filler section or layer 26 which is relatively hard and only moderately resilient and an outer section or layer 27 which is comparatively soft and markedly resilient. The inner layer or section 26 of this filler preferably consists of a twisted cord of asbestos having threads of cotton mixed therewith so as to give it strength and stability. This cord is of substantially cylindrical form in cross section and arranged on the inner side of the woven wire tube so as to extend across the slot 23 of the same.

The outer layer or section 27 of the filling preferably consists of loose asbestos fibers commonly known as asbestos wicking which is generally of crescent shape in cross section and interposed between the cylindrical inner filler section 26 and the inner side of the woven tube substantially opposite to the slot thereof, as shown in Figs. 1, 4 and 6, and forms therewith a filling which is of substantially cylindrical form in cross section as a whole. When this gasket is mounted on the door its flanges 24 are parallel with each other and with the plane of the door panel and the bead is turned inwardly relative to these flanges and rests against the inner side of the

flange 16 on the door panel so that the highly resilient wicking 27 of the bead faces the bearing surface 12 of the bake oven and is supported in this position by the less resilient cord 26 engaging the back side of this wicking, as shown in Figs. 1, 4 and 5.

Upon closing the door the bead portions of the gasket on the upper horizontal and the vertical edge portions of the door engage with the corresponding surfaces 12 on the opposing front end of the bake oven so that upon fastening the door by the usual means provided for this purpose, the bead will be flattened or deformed more or less in adapting itself to the contour of the bearing surface of the bake oven which is engaged by the bead, thereby sealing or packing the joint between the respective surfaces of the door and the oven and preventing the escape of any vapors or the like therethrough. Upon again opening the door the resilience of the bead, due mainly to the elasticity of the fibers of the asbestos wicking, together with the slight resilience inherent in the asbestos cord and the resilience in the woven wire of the tube, will cause the bead to again expand to its normal condition and thus provide a yielding or cushioning function which permits of its continuous operation as a sealing or packing means for this purpose.

In its closed position the lower horizontal edge of the door is so close to or engages with the adjacent horizontal lower part of the bearing surface 12 of the front oven wall that there is little, if any, liability of any vapors escaping through this part of the joint between these members of the stove.

Inasmuch as the door upon being opened and closed moves in the arc of a circle which varies in length according to the distance from the fulcrum or axis of the door, that part of the resilient gasket farthest from the axis of the door hinges is compressed the greatest extent upon closing the door, while those parts of the bead nearer to this axis are deformed progressively less. In order to compensate for this difference in extent of compression to which this sealing or packing bead is subjected, only the upper horizontal portion of this bead and the upper parts of the vertical portions of these beads are made of full diameter while the lower vertical parts of these beads are made of small diameter, as shown at 28. This is preferably accomplished by terminating the lower ends of the vertical parts of the asbestos wicking 27 short of the lower ends of the corresponding ends of the asbestos cords thereof, as shown in Figs. 2 and 3, thereby enabling the door to be closed easily and effecting a practically uniform sealing or packing of the joint throughout the vertical opposing surfaces of the door and oven instead of encountering an undue resistance to such closing operation which would be liable to occur if the lower ends of the vertical portions of the bead were of the same diameter as the remaining upper portions of the same. Although this reduction in the diameter of the lower end portions of the vertical legs of the packing is best effected by omitting the resilient outer layers of asbestos wicking from the respective parts of the woven wire tubing, this may also be produced by proportionally reducing the thickness of both the inner and outer layers of the filling in the lower parts of this tube. In order to facilitate the handling of this woven wire strip and the filling enclosed therein during the operation of applying this gasket to the door of the

stove, means are provided for connecting the flanges of the strip and holding them together. Various means may be used for this purpose but it is preferable to employ those which are shown in the drawing and which consist of binders applied to the horizontal and vertical portions of the strip. Each of these binders may be constructed of a sheet of metal, preferably of stainless steel, which is bent to form a U-shaped channel the two plies 29 of which receive between them the edges of the two flanges of the respective part of the woven strip. These parts are held together by tightly pressing the same against each other, as best shown in Figs. 4, 5 and 6. When the binding is thus applied to the woven strip, the latter is maintained in its closed position so that the fibrous filling therein cannot become displaced, thereby permitting this gasket to be readily and conveniently handled and applied to the door.

In some stoves, as shown in Figs. 7, 8 and 9, the front wall of the same is provided around the opening of the oven 10 with a countersunk shoulder or rabbet 30 which is opposite the inwardly projecting flange 16 on the panel 15 of the door, and the inner side of the latter is protected against warping under the heat in the oven by means which include a sheet metal liner having a central shield 31, an offset 32 around the edge of the shield, and a flange 33 projecting outwardly from the edge of the offset 33 and spaced from the inner side of the flange 16 on the door panel. This liner is secured to the door by a plurality of screws 34 passing through the offset of the liner and into metal cleats 35 secured to the inner side of the door panel, thereby avoiding the formation of any screw holes in the door panel. The space between the door panel and the liner is filled with a heat insulating filling 36 such as asbestos wool or sheets.

In this form of door and liner the flanges 24, 24 of the woven wire strip are arranged transversely between the inwardly projecting flange 16 of the door panel 15 and the outwardly projecting flange 33 of the liner, the tube 22 of the strip is arranged adjacent to the inner parts of these flanges and the inner ends of the strip flanges 24 are provided with correspondingly bent hooks 37 which extend around the inner edge of the liner flange 33 and are clamped by the latter against the inner side of the door panel so as to fasten the gasket thereto.

In this case the center of the gasket bead is arranged substantially in the same plane as the transverse flanges of the woven strip and the bead thereof is supported on opposite sides of the slot in its tube by engagement with the door and liner flanges, thereby insuring uniform flattening of the same as the inner side of this bead engages with the bearing face formed by the rabbet 30 on the oven upon closing the oven door, as shown in Fig. 8.

Obviously this gasket may be mounted on the front end of the oven around its inlet opening instead of on the edge portions of the door.

Inasmuch as this gasket can be made from materials which are not produced according to standard methods, it is possible to furnish the same at relatively low cost without appreciably increasing the cost of a stove as a whole.

Owing to this gasket being concealed when in use, the same does not detract from the appearance of the stove and as it positively prevents any staining of the stove front a neat appearance of the same is maintained. As the escape of

vapors is positively prevented, cooking can be effected in less time than heretofore and a substantial economy is effected incident to a saving of fuel.

- 5 When this gasket is used in places where the entrance of air from the exterior into the interior of a compartment is objectionable, such, for example, as in the ash pit of a furnace, a saving of fuel can be effected and a better control of the fire can be maintained. In the case of a
10 clean-out door or cover used in connection with a chimney, the prevention of leakage of air into the chimney insures a better draft through the same and a more satisfactory operation of the furnace or heating apparatus connected with the
15 chimney.

- Moreover this improved gasket may be advantageously employed between the working chambers and the doors of annealing and hard-
20 ening furnaces and other installations presenting conditions which render it desirable to avoid leakage of gases in order to economize in the use of fuel and also obtain better control of the heating operation which may be an important item
25 when processing materials.

We claim as our invention:

1. A gasket for sealing the joint between a body having an opening and a door adapted to close said opening and hinged at its lower horizontal
30 edge to said body, said gasket including a horizontal section mounted on the upper horizontal edge portion of the door and adapted to engage the corresponding opposing part of said body and two vertical sections mounted on the vertical
35 edge portions of said door and adapted to engage the corresponding opposing parts of said body, said horizontal gasket section being of uniform cross section throughout its length and the up-

per end portion of each of said vertical sections having the same cross section as said horizontal section while the lower end portion of each of said vertical sections is of downwardly tapering form.

2. A gasket for sealing the joint between a
5 body having an opening and a door adapted to close said opening and hinged at its lower horizontal edge to said body, said gasket including a horizontal section mounted on the upper horizontal
10 edge portion of the door and adapted to engage the corresponding opposing part of said body and two vertical sections mounted on the vertical edge portions of said door and adapted to engage the corresponding opposing parts of said
15 body, said horizontal section including a tube of woven wire, and a filling which is of uniform cross section throughout its length and consists of a hard cord of asbestos arranged in the rear
20 part of said horizontal tube, and a soft facing of loose asbestos wicking arranged in the front part of said horizontal tube; and each of said vertical sections including a vertical woven wire tube and a filling which is not of uniform cross section throughout its length arranged in each of
25 said vertical tubes and which consists of a hard cord of asbestos arranged in the rear part of each vertical tube, and a soft layer of loose asbestos wicking arranged in the front part of each vertical tube and the upper end portion of each of
30 said vertical wicking corresponding to the form of the wicking in said horizontal filling and the lower end portion of the wicking in each of said vertical fillings being of downwardly tapering form.

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