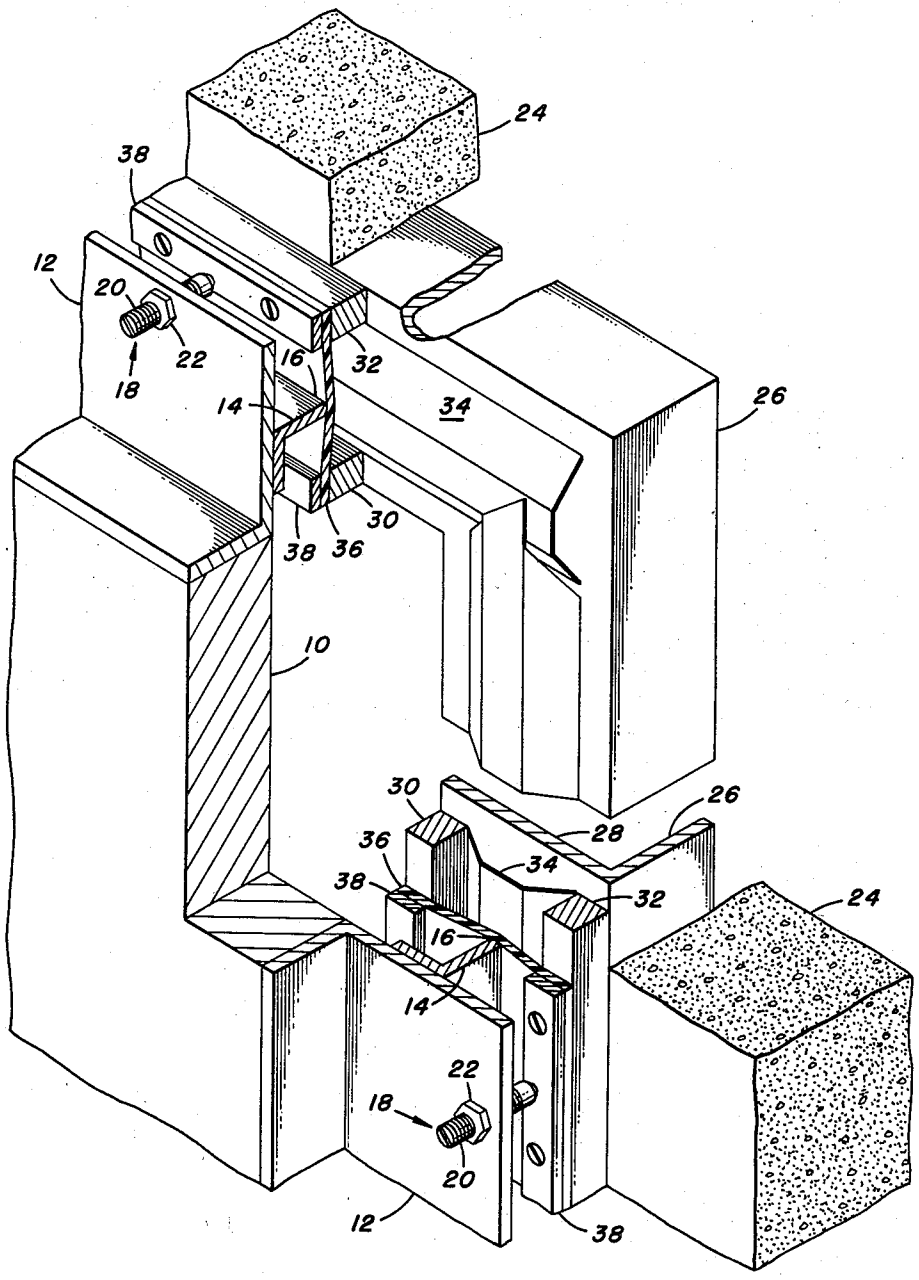
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DOOR SEAL

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DOOR SEAL

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The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to a door seal and more particularly to the construction of a door and door jamb which will prevent the passage of gas or air from one side of the door to the other even when the dimensions of the door are subject to variation due to temperature changes.

The present invention was conceived primarily as a solution to the problem of pressure sealing a large opening such, for example as an opening eight by sixteen feet, and wherein the door itself is subject to air pressures as high as sixty pounds per square foot and to temperatures as high as 400° F. Thus the door seal construction is such that the seal is maintained even where there is considerable expansion, warp and twist of the door and/or jamb.

An object of the present invention therefore is the provision of a door seal of the nature described which will prevent passage of air or other gas from one side of the door to the other.

Another object is to provide a door seal which will remain effective even though the door is subject to wide variations in temperature and therefore to variations in dimensions, due to expansion.

A further object of the invention is the provision of a door seal which will remain effective over an extended period of use, and which does not use materials which will deteriorate due to time, usage or extremes of temperature and pressure, to any appreciable extent.

Still another object is to provide a door seal which may be readily fabricated from commonly available materials.

A further object of the present invention is the provision of the door seal which may be used with extremely large openings.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figure and wherein:

The sole figure represents a perspective view, partly in cross-section, of a preferred embodiment of the invention.

Referring now to the drawings, there is shown a door 10 having an outstanding flange 12 extending thereabout. The flange 12 has secured thereto an L-channel 14 which presents a peripherally extending edge 16. Flange 12 also carries at proper intervals therealong a plurality of stop members 18, which are adjustably secured to the flange 12 by means of a screw thread 20 and nut 22.

The door jamb is placed in an opening in a building

or other structure, a part of which is indicated at 24. The jamb itself may take the form of an L-channel 26 positioned with a flange 28 thereof in the plane of the opening. Flange 28 carries two retainer bars 30 and 32 which, together, form a channel. In this channel there is positioned a strip 34 of spring, heat-resistant material, which is preferably spring bronze. Extended across the channel opening, and covering bronze strip 34 is a strong, impervious, heat-resistant diaphragm 36. Diaphragm 36 is preferably made of Fiberglas coated with a resilient heat-resisting plastic material, such as butyl rubber or silicone rubber. The diaphragm 36 is secured in place by holddown bars 38 placed on and secured to each of the retainer bars 30 and 32.

As may be seen, bronze strip 34 has a central portion which is generally perpendicular to the edge 16, this central portion being supported by two integral leg portions which rest in the bottom of the channel formed by flange 28 and retainer bars 30 and 32.

In operation, the door 10 is swung or otherwise moved into position opposite the door jamb. Edge 16 of flange 14 will contact the diaphragm 36 and there will thus be established at least a line contact about the entire door periphery. Preferably the edge 16 will contact approximately at the middle of the central portion of the spring bronze strip 34. Excess deflection of bronze strip 34 and diaphragm 36 will be prevented by the stop members 18. It will be obvious that specific sizes and adjustments will depend upon the particular temperatures and pressures existing at a particular installation. In all cases, however, the sealing will be maintained and effective due to the controlled amount of yielding of the diaphragm 36, supported and backed up by the spring strip 34.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the detailed description when considered in connection with the accompanying claims.

What is claimed is:

1. A door, a contact member on said door and extending peripherally thereof, said member having a rigid sealing edge positioned transverse to the plane of said door, a door jamb comprising a peripherally extending channel formed of a pair of parallel strips, a thin, strong, flexible, non-elastic, impervious diagram member extending across said channel and positioned on said strips, hold down means on each strip overlying the edges of said diaphragm member to secure said diaphragm member to said strips, a spring member in said channel underlying said diaphragm urging said diaphragm outwardly of said channel, said spring member having an extended flat portion producing a substantial peripherally extending flat area of said diaphragm member substantially parallel to the plane of said door jamb, said spring member having a spring leg member extending outwardly from each edge of said flat portion and lodged in said channel against said strips whereby upon closure of said door a peripheral line-contact seal is effected between said sealing edge and the flat, spring-supported portion of said diaphragm.

2. The apparatus of claim 1, and stop means on said door and engaging a portion of said jamb when said door is in closed position, said stop means being adjustable when said door is in closed position.

3. A sealing arrangement for a door and an associated structure having a door opening comprising, a frame supported on said structure in surrounding relationship to said door opening provided with a channel recess extending the full peripheral length of said frame, a thin, strong, flexible, non-elastic, impervious, heat-resistant diaphragm extending across the face of said channel re-

cess the full length thereof, means for securing the edges of said diaphragm along the edges of said channel recess, spring means within said channel recess continuously supporting said diaphragm and urging said diaphragm outwardly of said channel recess as a flat surface substantially parallel to the plane of the door opening, said spring means having a substantial continuous flat portion adapted to engage the diaphragm and a pair of spring leg members extending from each edge of said flat portion and lodged in the inner corners of said channel recess such that the figure in a plane transverse of said channel recess defined by the spring and the base of the channel recess opposite said diaphragm is substantially that of an isosceles trapezoid, a contact member extending peripherally of said door having a rigid sealing edge to effect substantially a peripheral line-contact seal with the flat, spring-supported portion of said diaphragm upon closure of said door.

4. The sealing arrangement of claim 3 having stop means on said door engaging a portion of said jamb when said door is in closed position, said stop means being adjustable when said door is in closed position.

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