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STOVE OVEN

Filed June 1, 1936

Fig. 1.

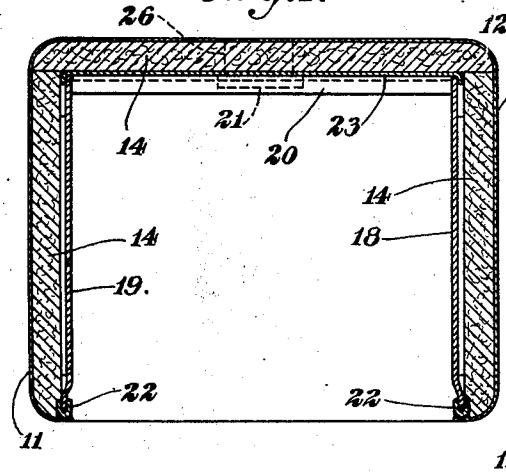


Fig. 3.

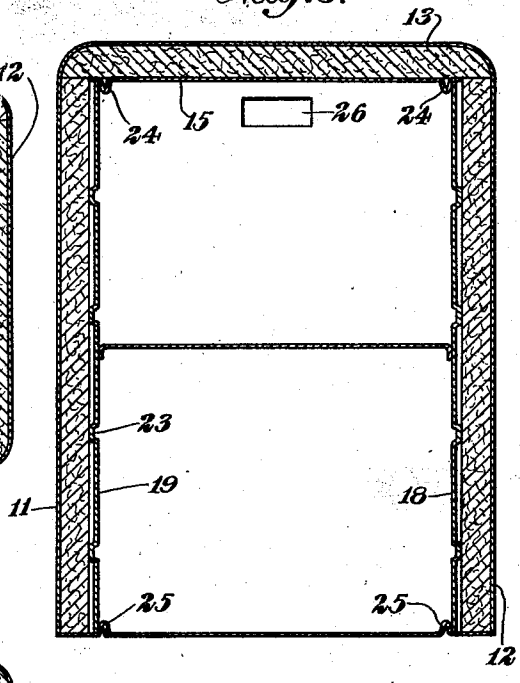
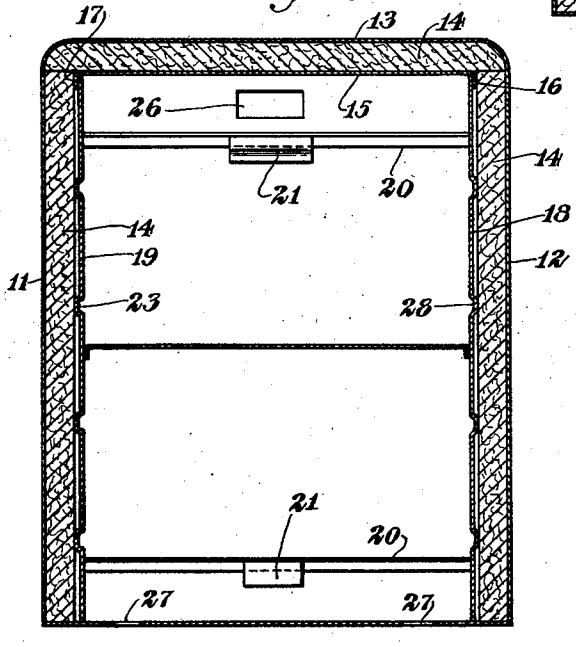


Fig. 2.



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STOVE OVEN

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4 Claims. (Cl. 220—9)

This invention relates to double-walled stove ovens or the like.

Such structures ordinarily have sheet metal outer and inner casing members, thermal insulation therebetween, and bolts, rivets, or other highly conducting elements connecting the said members and extending through the insulation.

We have now discovered a convenient and simple insulated double wall structure which makes possible the use of imperforate insulation, so that there is no through metal contact between the inside and the outside faces of the oven, and which makes possible a convenient and simple assembly of the insulation and inner casing members.

Not only is there a large reduction in heat transfer in my improved oven, due to omitting the metal parts extending through the double wall from face to face, but also there is avoidance, on the outside of the oven, of localized hot spots adjacent to the termini of the conventional metal elements extending through the wall.

These features are comprised within the present invention. Also, comprised with the invention is the supporting of an inside casing member of the double wall upon shape-retaining insulating material. An additional feature of the invention is the provision of means for holding side members of the inner casing so that the said members cannot fall inwardly and their movement inwardly is restricted. Other features and advantages of the invention will appear from the detailed description that follows.

For the purpose of exemplification, the invention will be illustrated by reference to the oven of a gas-fired stove and, particularly, by reference to the attached drawing in which:

Fig. 1 is a sectional plan view of an oven (without the door and door accessories);

Fig. 2 is a sectional elevational view of the assembly of Fig. 1; and

Fig. 3 is a sectional elevational view of a modification of the invention in which special means are associated with certain inner casing members to limit the inward movement of other members of the casing.

There is shown an outer box-like casing, say, one of sheet steel, forming the two side portions 11 and 12, respectively, and the top portion 13 of the outside casing of an oven. The back of the outer casing extends between the sides 11 and 12 (Fig. 1) and downwardly from the top 13. Disposed within this casing, extending thereover, and, suitably, fitting closely against all portions thereof is thermal insulating material 14 in the form of self-sustaining slabs or blocks.

A desirable type of such insulation may be constituted largely of heat-resistant fibres, such as rock wool and/or asbestos, and a heat-resistant binder bonding the fibres into a shape-retaining and relatively rigid unit. Such insulation is commonly sold as stove insulation, an example of which is a mixture of asbestos and rock wool fibres bonded with clay.

In making such insulation, there may be formed, on a rotary filter press, a filter cake including a large proportion of asbestos and rock wool fibres, clay, and water. When the cake has been built up to proper thickness, it is removed from the filter, shaped to approximately flat form, and dried at an elevated temperature, to develop a bond in the clay. The resulting product is then trimmed to proper dimensions, for insertion into the article of the present invention.

Disposed inside the said insulation is the inner box-like casing of the article or assembly. This casing includes the inner top member 15, which is disposed just below the insulation under the top of the outer casing. This member 15, in turn, is supported at its turned-down edge portions 16 and 17 upon the metal sheets 18 and 19 constituting the inner side facing members of the oven. These sheets, suitably, are disposed in contact with the side insulating slabs and are held apart, in spaced relationship to each other and against the insulating side slabs, by means of spreaders or spacing members 20. The sheets are thus limited as to inward movement and are prevented from falling inwardly. The side and top members of the inner casing are independent of each other, that is, are not secured together but may be inserted separately and moved independently with respect to each other until abutment results.

Suitably, these spreaders 20 are strips of iron, say, angle irons which are engaged by suitable clips 21. Such clips may include each a short strip of bent sheet iron secured at its lower portion to the back (vertical) wall of the oven and, at its top portion, spaced from the back wall, so as to define a space of somewhat V-shape of cross section, in which space the lower parts of the angle bars 20 may be inserted.

At the front part of the oven, that is, near the door (not shown), the side members of the inner casing are engaged by elements 22 which may be hook-like or channel-shaped elements continuous with and secured to the front portion of the

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outer casing member. The elements 22 are preferably constituted of poorly conducting material resistant to deterioration at oven temperatures. Thus they may consist of fired clay ware.

The portion of the inner casing constituting the back member 23 is arranged, suitably, as illustrated, in contact with the rear insulating slab and held backwardly thereagainst by abutment with the rear edges of the side inner casing members.

The abutment of the inner side casing members at their forward edges against elements 22 insures that there is, at all times, firm contact of the rear parts of the said members against the inner rear facing member 23.

In making an assembly such as illustrated in Figs. 1 and 2, it is convenient to have the insulating slabs slightly oversize, so that a slight pressure is required to force them into position inside the outer casing. In this manner, the units once forced into position, will stand by themselves for a short time, while the various parts of the inner casing are being introduced.

We have found it convenient to insert the top, side and back insulating slabs and the top inner casing member 15 before the inner side and rear facing members are introduced. The inner side facing members may be provided with conventional irregularities such as the recesses 28 for holding grids of usual type. Also, the bottom of the oven may be of usual design and may be provided with vents 27.

In comparing an oven of the kind described with conventional double-walled oven construction, involving through metal parts, we have found, in our improved oven, thermal insulating slabs weighing more than 12 pounds to the cubic foot to be as satisfactory in heat conservation as a conventional oven containing the usual through metal parts and having thermal insulation weighing only 6 pounds to the cubic foot.

In a modification of the invention shown in Fig. 3, the spreader parts 20 are omitted and are replaced by means associated with the inner top casing member for holding apart the inner side casing members. These means include ribs 24 or other projections on the inner surface of the top inner casing member. Suitably, similar irregularities 25 are used also on the bottom of the oven. These ribs are spaced just inside the inner surface of the side insulating slabs, so that when the side plates 18 and 19, which are somewhat springy, are forced therebehind, these side plates are snapped in position and locked behind the said ribs and against the inside of the insulating slabs.

The opening 26 is for flue connection to the oven.

In general, the absence of perforations, that is, the continuity of the insulation between the corresponding parts of the outer and inner casings, necessitates that substantially all of the heat transferred through the wall must pass through the insulation. An exception is the small amount that may pass through the joints between adjacent insulating slabs. This part of the transferred heat is, however, very small, inasmuch as the various slabs abut tightly at the joints and are preferably yieldable or friable to the extent that the joints practically close themselves when the various slabs are forced together as described.

It will be understood that the details given are for the purpose of illustration, not restriction, and that variations within the spirit of the invention are to be included in the scope of the appended claims.

What I claim is:

1. An oven comprising an outer box-like casing open at one side, shape-retaining insulating slabs tightly engaging within the casing to form a substantially self-supporting insulation structure in contact with the top, back and sides of the outer casing, a sectional inner casing including independent top, back and side members overlying said insulation structure, the edges of said outer casing at the open side thereof carrying insulating means receiving and holding in position the forward edges of the side members of the inner casing whereby said edges of said side members are restrained from lateral movement, the inner back member including means extending from its vertical edges engaging the rear edges of said side members to restrain them from outward movement, and means removably supported by said back member pressing the side members outwardly against said means on said back member to lock the side and back members in assembled relationship.

2. An oven comprising an outer box-like casing open at one side, shape-retaining insulating slabs tightly engaging within the casing to form a substantially self-supporting insulation structure in contact with the top, back and sides of the outer casing, a sectional inner casing including independent top, back and side members overlying said insulation structure, the edges of said outer casing at the open side thereof carrying insulating means receiving and holding in position the forward edges of the side members of the inner casing whereby said edges of said side members are restrained from lateral movement, the inner back member including flanges extending from its vertical edges engaging the rear edges of said side members to restrain them from outward movement, and means removably supported by said back member pressing the side members outwardly against said flanges to lock the side and back members in assembled relationship.

3. An oven comprising an outer box-like casing open at one side, shape-retaining insulating slabs tightly engaging within the casing to form a substantially self-supporting insulation structure in contact with the top, back and sides of the outer casing, a sectional inner casing including independent top, back and side members overlying said insulation structure, the edges of said outer casing at the open side thereof carrying insulating means receiving and holding in position the forward edges of the side members of the inner casing whereby said edges of said side members are restrained from lateral movement, the inner back member including means extending from its vertical edges engaging the rear edges of said side members to restrain them from outward movement, and means removably supported by said back member pressing the side members outwardly against said means on said back member to lock the side and back members in assembled relationship, said top member including flanges engaging the upper edges of the side wall members.

4. An oven comprising an outer box-like casing open at one side, shape-retaining insulating slabs tightly engaging within the casing to form a substantially self-supporting insulation structure in contact with the top, back and sides of the outer casing, a sectional inner casing including independent top, back and side members overlying said insulation structure, the edges of said outer

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casing at the open side thereof carrying insulating means receiving and holding in position the forward edges of the side members of the inner casing whereby said edges of said side members are restrained from lateral movement, the inner back member including means extending from its vertical edges engaging the rear edges of said side members to restrain them from outward movement, and means removably supported by said back member pressing the side members outwardly against said means on said back member to lock the side and back members in assembled relationship, said side members contacting said insulation in limited areas only.

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