March 3, 1953 J. W. A. LOVATT 2,629,917

MUFFLE STRUCTURE FOR USE IN FIRING KILNS AND OVENS

Filed May 16, 1951 2 SHEETS—SHEET 1

FIG. 1.

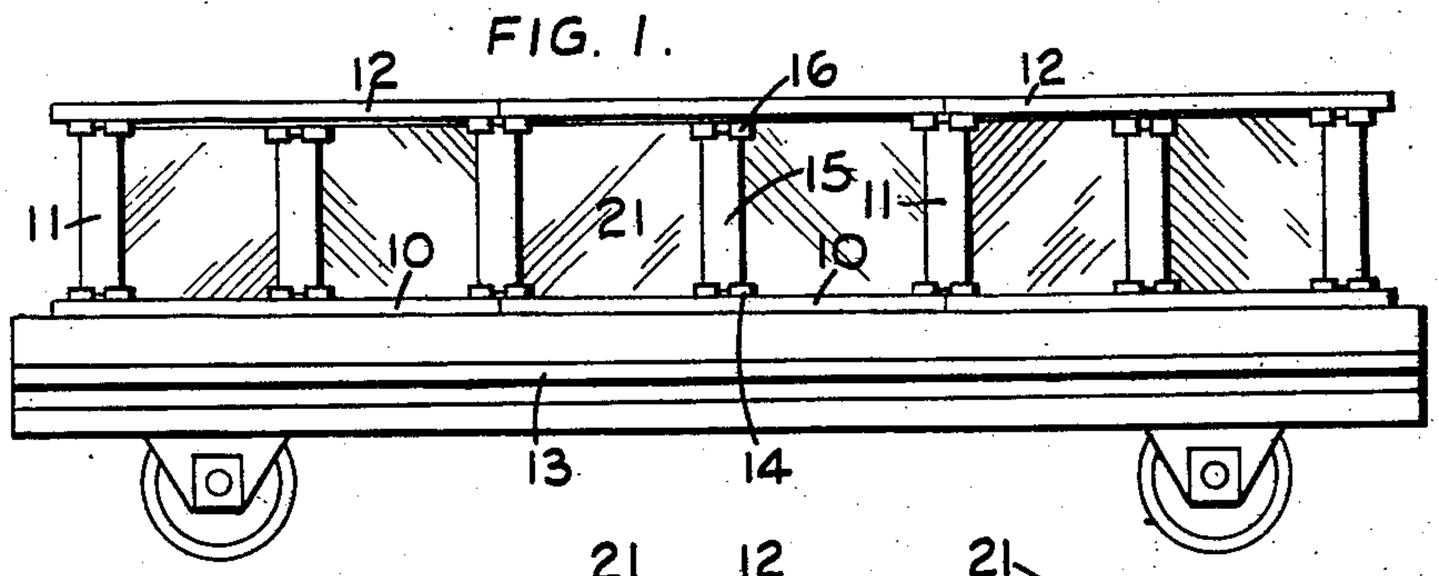

FIG. 2.

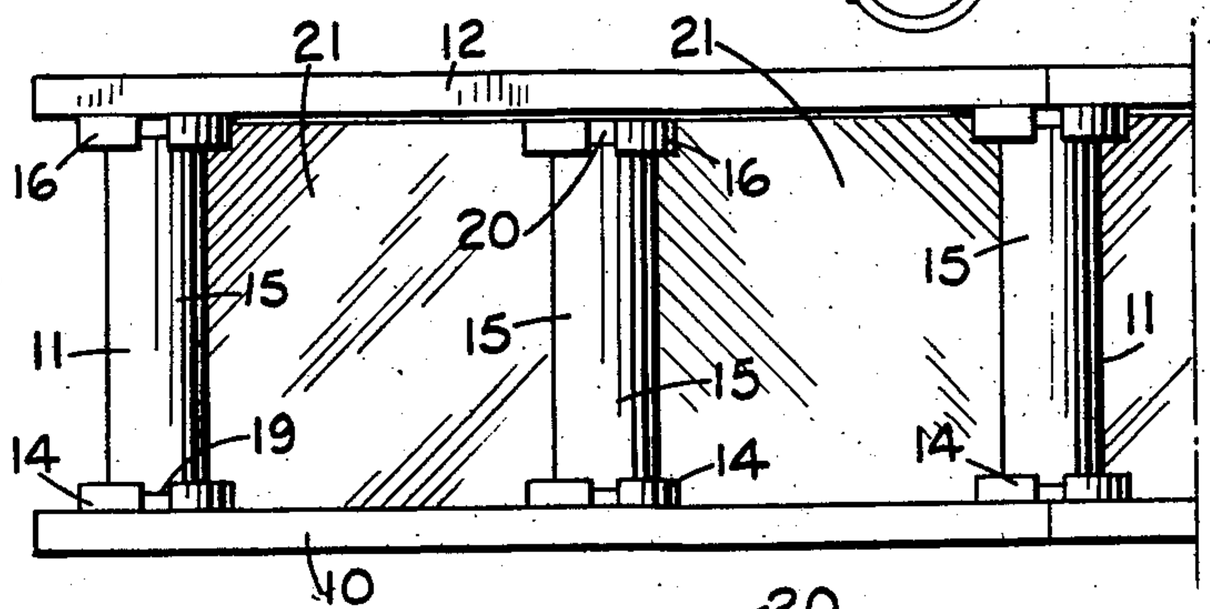

FIG. 4.

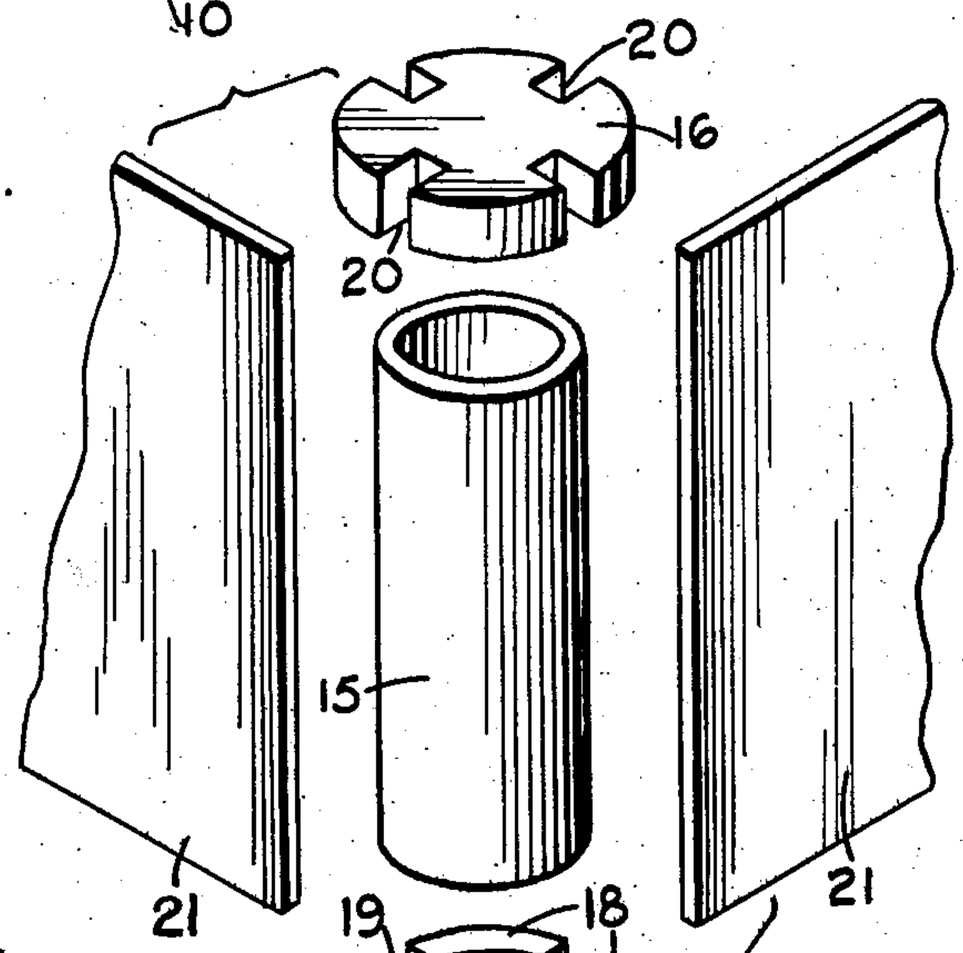

FIG. 3.

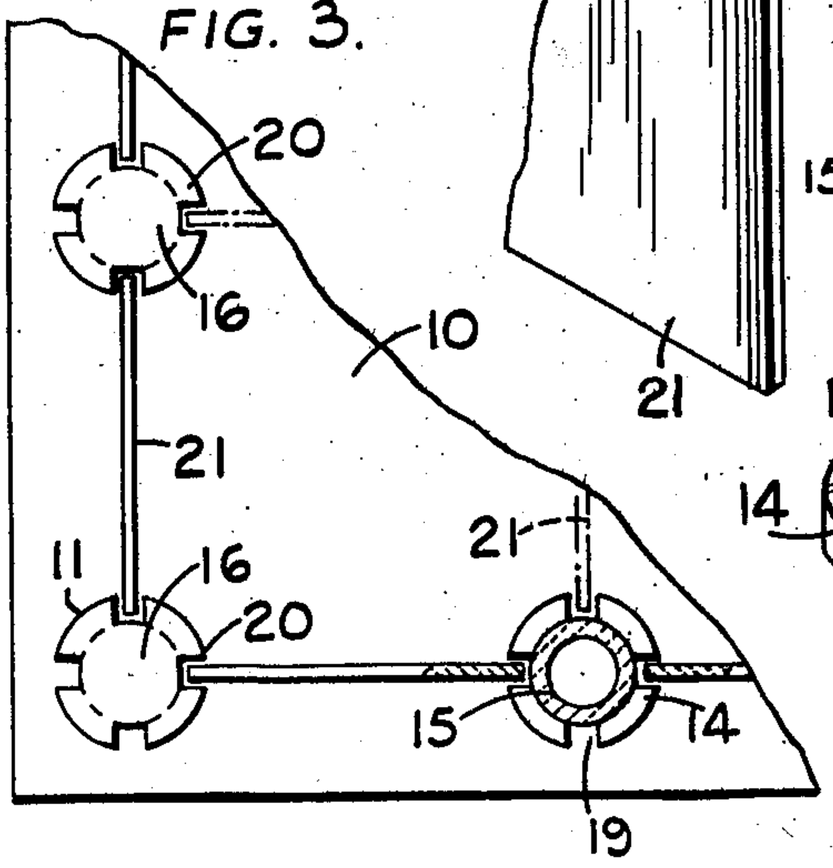

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FIG. 5.

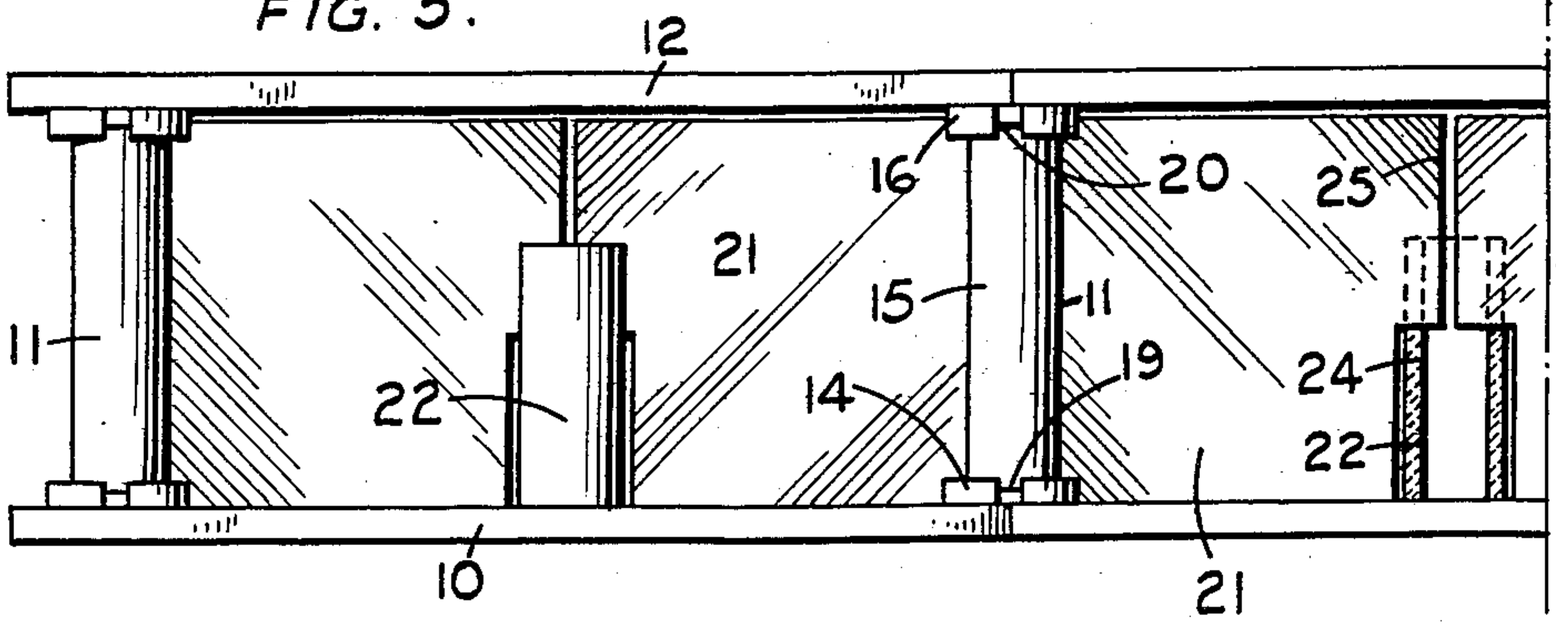

FIG. 7.

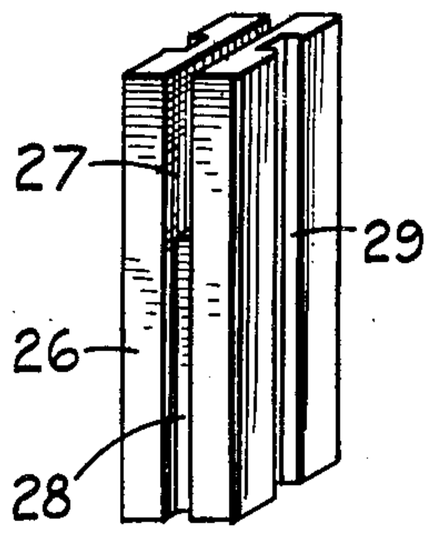

FIG. 6.

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MUFFLE STRUCTURE FOR USE IN FIRING KILNS AND OVENS

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2 Claims. (Cl. 25—153)

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This invention relates to muffle structures for firing kilns and ovens of the kind comprising a base, a number of supporting pillars mounted on the base and one or more shelf members mounted on the pillars, it being understood that a plurality of such structures may be mounted one above the other in the which case the upper shelf of one structure forms the base of the structure immediately above, wall members being disposed between said pillars so as to muffle the goods on the shelves from the direct heat of the kiln or oven.

In firing ovens and kilns used in many different classes of work, it is known to use a muffle or container for partially or completely shielding the articles being fired from direct contact with flames or the source of heat, but in many cases it is not essential to baffle or muffle the whole of the structure, and since it is advantageous to keep the weight of the muffle structure employed to a minimum in the interest of fuel economy, one object of this invention is to provide an improved structure which will secure this advantage and at the same time give efficient baffling or muffling of parts or the whole of the structure.

A further object is to provide a structure which can readily be dismantled and packed into a small space for transportation.

The invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a view in side elevation of a muffle structure mounted on a kiln car.

Figure 2 is an enlarged side elevation of a muffle structure.

Figure 3 is a plan view partly in section showing a corner of a muffle structure.

Figure 4 is an enlarged detail showing the various parts of a supporting pillar.

Figure 5 is a side elevation showing an alternative form of muffle structure.

Figure 6 is an enlarged detail showing the parts of the structure shown in Figure 5 in opened-out position, and

Figure 7 is a perspective view of an alternative form of supporting pillar.

In the construction shown in Figures 1 to 4, the muffle structure comprises a base 10 on which are mounted a number of supporting pillars 11, shelves 12 resting on the top of these supporting pillars 11. As seen in Figure 1, a number of these structures are mounted on a kiln car 13. Each supporting pillar 11 is composed of three units as best seen in Figure 4, these units being a base member 14, a supporting member 15 and an upper member 16 and, although these three parts may be separate, as seen in Figure 4, it will

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be understood that they may, if desired, be secured together by suitable cement, or they may be integral.

Each base member 14 is in the form of a circular disc and comprises a central socket portion 17 surrounded by a flange portion 18, the flange being provided with two pairs of diametrically opposed slots 19 which extend axially through the depth of the flange, the one pair being disposed at right angles to the other. The supporting member 15 is of hollow cylindrical form and its lower end is adapted to be received in the socket portion 17 of the base member 14. The upper member 16 is of the same form as the base member 14, that is to say, it is provided with a central socket portion, not shown in the drawings, and with pairs of slots 20. This upper member 16 is, of course, mounted in an inverted position as compared with the base member 14, the socket portion of the member 16 engaging over the upper end of the supporting member 15, the upper and base members being so positioned that their slots 20 and 19 are in axial alignment.

These supporting pillars 11 are mounted at the four corners of each base 10 and they may also be provided intermediate the corners of the base as shown in the drawings. If it is desired to provide wall members on all sides of the muffle structure, these wall members which are in the form of panels 21 of refractory material are inserted into the slots 20 and 19 of adjacent pillars 11. It is, of course, necessary to insert these wall members 21 before the shelves 12 are placed in position, but it will be seen that it is extremely easy to insert or withdraw these wall members so that the amount of baffling for the muffle structure can be varied at will.

By providing the pillars 11 in the form of three separate units, the muffle structure can be knocked down into a small space for transportation and also, should any parts of the pillars become damaged, it is only necessary to replace the one unit and not the whole of the pillar.

As shown in Figure 3, the pillars 11 which are intermediate the corners of the base 10 may support internal wall members 21, and these pillars 11 which are intermediate the corners of the base 10 may be slightly shorter than the corner pillars 11 so that their upper ends do not support the shelf 12. With this construction these shorter pillars 11 can be withdrawn without disturbing the shelf 12, as for reasons hereinafter described there will be a certain amount of play between the wall members 21 and the slots in which they engage.

In the construction shown in Figures 5 and 6,

the muffle structure is of substantially the same form, that is to say, it comprises a base 10, supporting pillars 11 and shelves 12, the supporting pillars comprising upper and base members 16 and 14 respectively and cylindrical supporting members 15 disposed between and engaging in these members 16 and 14. In this construction, however, the pillars 22 which are disposed between a pair of pillars 11 are of lesser height than the pillars 11 and are in the form of hollow cylinders which rest with their lower edge on the base 10. The upper portion of each intermediate pillar 22 is provided with a pair of diametrically opposed slots 23 which extend through the thickness of the wall of the pillar.

The wall members 21 are in this construction provided on one of their end edges with a cut-away portion 24, the non-cut-away portion 25 of this edge being adapted to engage in the slots 23 of the intermediate pillar 22, whilst the other end edge of the wall member 21 engages in the slots 20 and 19 in the pillar 11. The object of this construction of wall members and intermediate pillars is to enable the wall members to be removed without the necessity of removing the shelf 12. As will be appreciated by one skilled in the art, a certain amount of play must be allowed between the wall members and the sides of the slots in which they engage so as to allow for expansion and buckling due to heat, and it will be seen, therefore, that the intermediate pillars 22 can be moved outwardly of the structure until they are clear of the base 10 whereupon they can be dropped downwardly so as to disengage their upper ends from the wall members 21. Thus the wall members can be removed without removing the shelf members and this is, of course, extremely advantageous when a number of muffle structures are stacked one above the other.

Instead of providing the intermediate pillar 22 of hollow cylindrical shape, it may be of rectangular form, as shown in Figure 7, and in this case the intermediate pillar 26 is provided at its upper end with a longitudinal groove 27 of substantial depth which extends from end-to-end of the pillar, the lower portion of the pillar being provided on these end faces with shallow grooves 28, the groove 27 and the grooves 28 being adapted to receive the cut-away end edges of the wall

members 21. In addition, this pillar 26 is provided on its side faces with shallow grooves 29 which extend from top to bottom of the pillar, and these grooves 29 are adapted to receive further wall plates 21 which may be disposed within the outer wall of the muffle structure.

What I claim then is:

1. In a muffle structure having a base, supporting pillars mounted on said base and a shelf mounted on said pillars, said pillars having guide portions adapted to detachably receive wall members; an intermediate pillar mounted between a pair of supporting pillars, said intermediate pillar having guide slots formed in opposed faces thereof, a side wall member formed in two halves each half detachably engaging in a guide slot in the intermediate pillar and in the guide portions of a supporting pillar whereby the side wall can be removed without dismantling the structure.

2. In a muffle structure having a base, supporting pillars mounted on said base and a shelf mounted on said pillars, wall members mounted between said pillars, said pillars having guide portions adapted to detachably receive the wall members; an intermediate pillar mounted between a pair of supporting pillars, said intermediate pillar being of hollow cylindrical shape, said pillar having a pair of diametrically opposed slots in the upper end thereof, a side wall formed in two halves, the lower portion of one end edge of each half being cut-away, the non-cut-away portion of said end edge of each half detachably engaging a slot in the intermediate pillar, the other end edge of each half detachably engaging in the guide portions of a supporting pillar whereby the side wall can be removed without dismantling the structure.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
954,029	Jester	Apr. 5, 1910
1,642,938	Morris	Sept. 20, 1927
1,694,749	Moore et al.	Dec. 11, 1928
2,297,286	Book	Sept. 29, 1942