Sept. 20, 1971 G. V. PRIBLE 3,605,370
PREASSEMBLED INSULATING PANELS FOR HIGH TEMPERATURE FURNACES
Filed March 23, 1970 2 Sheets-Sheet 2

FIG. 3

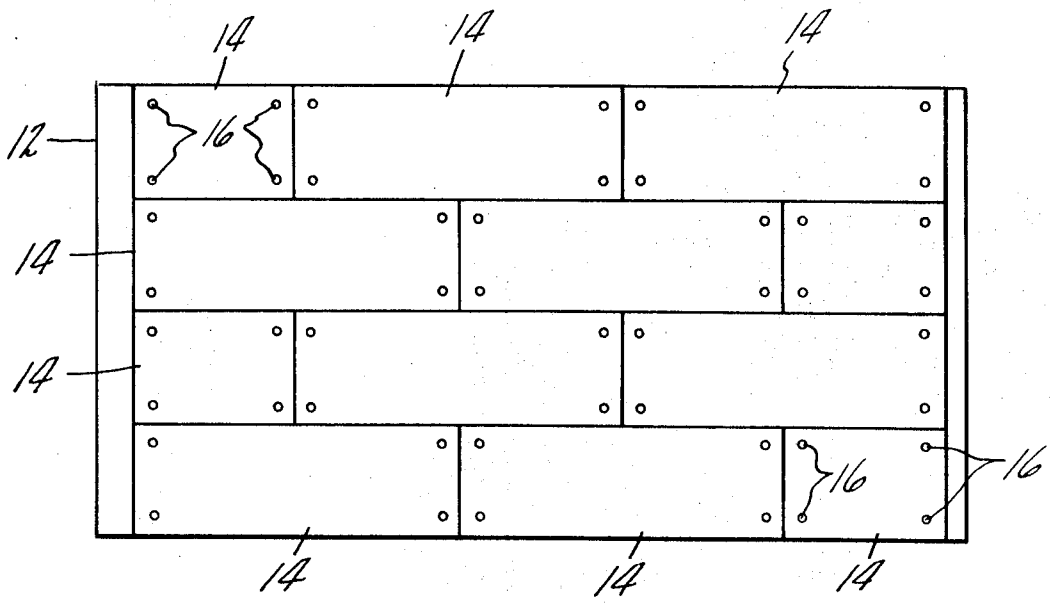
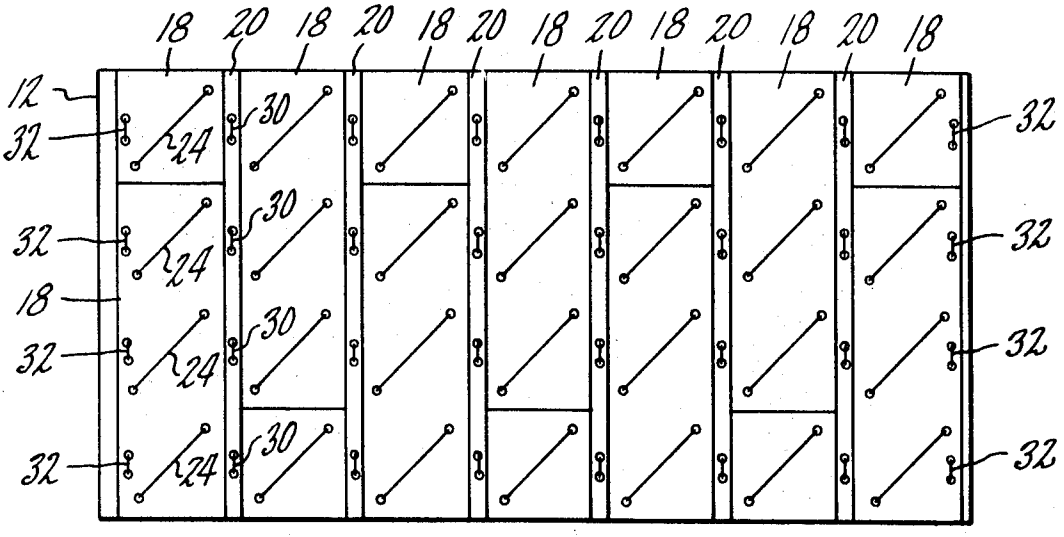


FIG. 4



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STABILIZING SPACER FOR THE STEPS OF SPIRAL STAIRCASES WITH METAL NEWELS

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14,388/68
Int. Cl. E04f *11/00*
U.S. Cl. 52—720 1 Claim

ABSTRACT OF THE DISCLOSURE

An annular component securable to the end of a tubular element of a stabilizing spacer for the steps of a spiral staircase. The component has a first flat collar to which a second collar is welded at two diametrally opposite spots. The first and second collars have equal inside diameters to allow free passage of a step-supporting newel. The outside diameter of the second collar is slightly smaller than the inside diameter of the tubular element to permit engagement with the tubular element. The second collar is bent around the diameter extending through the welding spots to progressively diverge from the first collar and insertable the tubular element to center the latter.

The present invention relates to a novel component which may be employed as part of a stabilizing spacer for the steps of spiral staircases with metal newels. More precisely, the invention relates to spacer end disk components which may be utilized in staircases having metal newels not sheathed with wood.

SUMMARY OF THE INVENTION

As is well known, stabilizing spacers for winding staircases consist of a tubular muffle spacer element having a longitudinal dimension nearly equal to the step rise, and completed on either end by relatively thin annular members which are inserted between the spacer element proper and the steps, in order to keep the spacers centered on a supporting tubular newel as shown in my copending application, Ser. No. 809,767, filed Mar. 24, 1969. In particular, disks having a central opening to be slipped on the newel have heretofore been utilized as such annular members. Such disks have also been fabricated with an annular projecting ridge by means of which the muffle element is kept centered, because it functions as a shoulder or aligning ring engaged inside of the muffle element and is stabilized therein. Each of such disks resembles a cover centrally apertured to allow for the free passage therethrough of a step-supporting newel.

Obviously, such annular members of the well known type require many machining operations because of the presence of said ridge, and therefore they are very expensive.

The above drawback is obviated by the present invention through the provision of annular components for muffle spacers as may be required for spiral staircases, which can be produced in a simpler and quicker manner, being therefore much cheaper while comparing favorably or exceeding the conventional types from the viewpoint of efficiency of preformance in actual use.

The above and further purposes are attained by the component of the present invention which may be used as part of a stabilizing spacer for spiral staircase steps of the type comprising a tubular muffle spacer element and two annular components, fastened like covers on either end thereof. The novel annular component consists of a first flat collar, whereon a second collar is welded on

two diametrally opposite spots. The inside diameter of latter collar is equal to that of first collar in order to allow for the free passage of step-supporting newel. However the outside diameter of same second collar may be slightly smaller than the inside diameter of the muffle spacer element to permit engagement with such element. The second collar is upwardly bent around the diameter extending through the welding spots, thus progressively diverging from the first collar in order to act as an efficient adjusting stop.

The present invention provides in a broader context a novel component including a first member, such as the first flat collar, having at least one substantially flat major surface and a first predetermined dimension, such as the outer diameter of the first flat collar, of said substantially flat major surface. The component also includes a second member, such as the second collar, which is connected to the first member at at least two substantially diametrically opposed locations of the substantially flat major surface. The second member diverges away from a line determined by the two substantially diametrically opposed locations and away from the substantially flat major surface of the first member. The second member has a dimension, such as its outer diameter, which is substantially equal to or less than and which is substantially parallel to the first predetermined dimension of the substantially flat major surface of the first member.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The drawings represent only one possible embodiment of the invention. In the drawings:

FIG. 1 is a perspective view of a tubular muffle spacer with two annular components according to the invention; and

FIG. 2 is a vertical section of the tubular muffle spacer element with the annular component fitted on its top.

With reference to the drawings, *a* is a tubular muffle spacer element that represents the spacer body, and *b* is an annular component according to this invention.

DETAILED DESCRIPTION

The component *b* may consist of a first member or flat collar **1**, having an inside diameter **2** to allow the collar **1** to be slipped on a tubular step-supporting newel (not shown). Welded on diametrally opposite locations or spots **3** of the first flat collar **1** is a second member or thinner collar **1***a* having an inside diameter **2***a* equal to diameter **2** of the first flat collar **1**, while its outside diameter **4** may be slightly smaller than the inner diameter **4***a* of tubular element *a*. The second collar **1***a* may be upwardly bent around the diameter extending through the welding locations or spots **3** thus acquiring a so-called "mule-back" shape, as can be seen in FIG. 2. Otherwise stated, both halves of the second member or collar **1***a* diverge progressively and symmetrically from the first member or collar **1** beginning from the welding locations or spots **3**. Thus, the second member or collar **1***a* fits snugly inside of the tubular muffle spacer element *a*, being to such a purpose utilized the distance from the collar *a*, which in FIG. 2 has been expressely enlarged, but that in practice will be on an average equal to half of the maximum value as shown in FIG. 2.

Thus, in point of fact, by an unusually simple and cheap assembly, consisting of a first member or collar **1**, to which an upwardly bent second member or collar **1***a* is spot welded, a component *b* is obtained which is wholly equivalent, from an efficiency and performance standpoint to the much more expensive conventional one, consisting of a flat body with an integral massive ridge which is to

failure of materials due to the furnace action, the panels can be readily and economically interchanged. Due to the unique construction of spaced rows of refractory block and overlying high temperature insulating ceramic wool blanket folded within the transverse spaces, it is possible to supply anchor mechanisms for the wool blanket which are not directly exposed to the high temperature and corrosive conditions of the furnace atmosphere and thus are not subject to premature failure.

While these preferred embodiments of the invention have been shown and described, it will be understood that they are merely illustrative and that changes may be made without departing from the source of the invention as claimed.

I claim:

1. Preassembled interconnectable insulating panels for high temperature furnaces, said panels comprising a metal backing, at least one layer of refractory block fixed in rows to said metal backing so as to have transverse spaces between adjacent rows, a high temperature insulating ceramic wool blanket covering said at least one layer of refractory block and folded into the transverse spaces between said adjacent rows, and anchor means for securing said high temperature insulating blanket to said metal backing, said anchor means positioned within said folds of said insulating blanket so as to be protected from direct furnace exposure.

2. The assembly of claim **1** wherein there is a first layer and a second layer of refractory block fixed to said metal backing, said first layer located between said backing and said second layer and oriented transversely to said second layer, said second layer lying in transversely spaced rows across said first layer.

3. The assembly of claim **1** wherein said at least one layer of refractory blocks are formed from calcium silicate.

4. The assembly of claim **1** wherein said high temperature insulating ceramic wool blanket is formed of an alumina-silicate ceramic fiber.

5. The assembly of claim **1** wherein said anchor means comprises elongated alloy rods positioned within said folds of said insulating blanket, said alloy rods being secured to said metal backing by means of alloy wire.

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