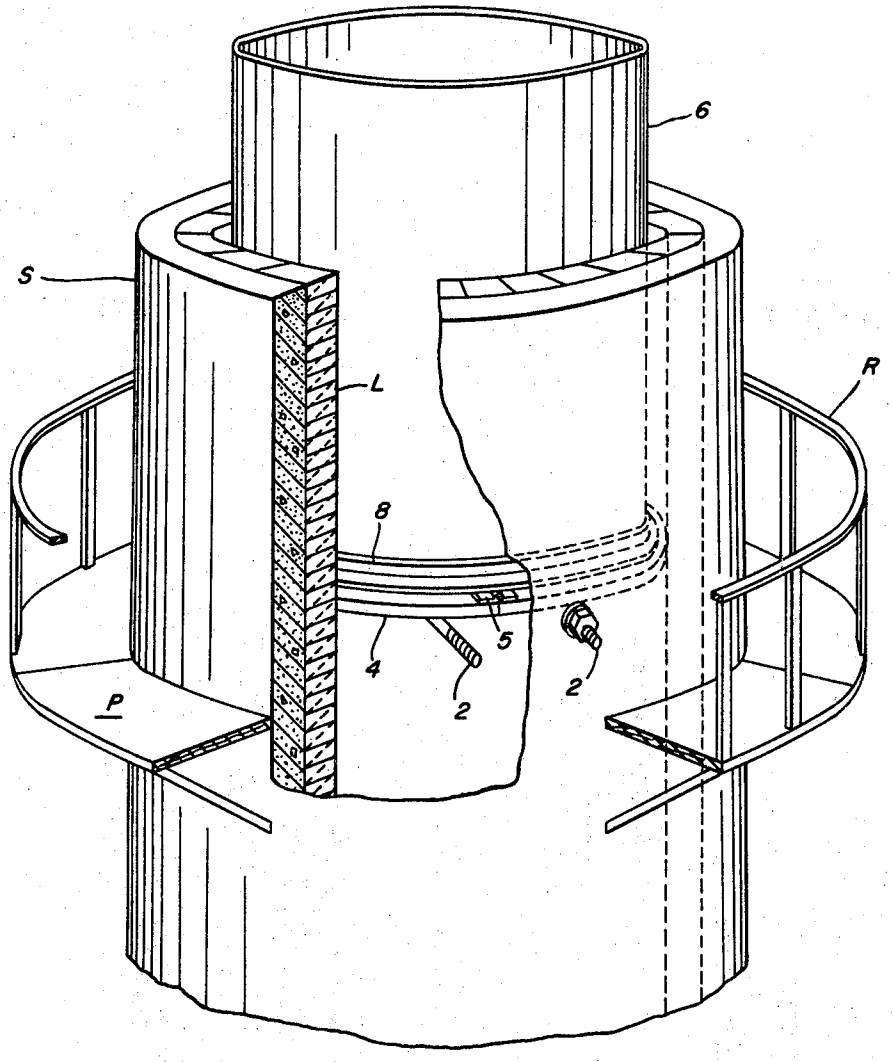
Nov. 14, 1967 C. E. BOLE 3,352,072

TEMPORARY LINER FLUE ASSEMBLY
FOR REPAIRING MASONRY STACKS

Filed April 16, 1965 2 Sheets-Sheet 1

FIG. 1.



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FIG. 2.

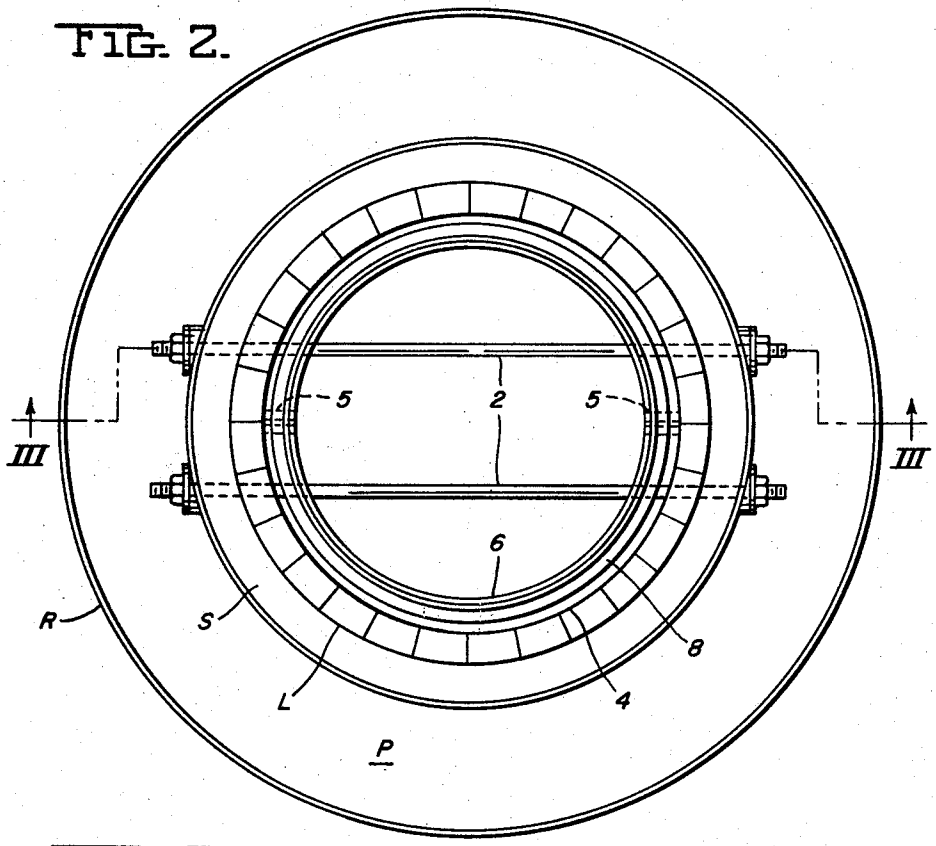
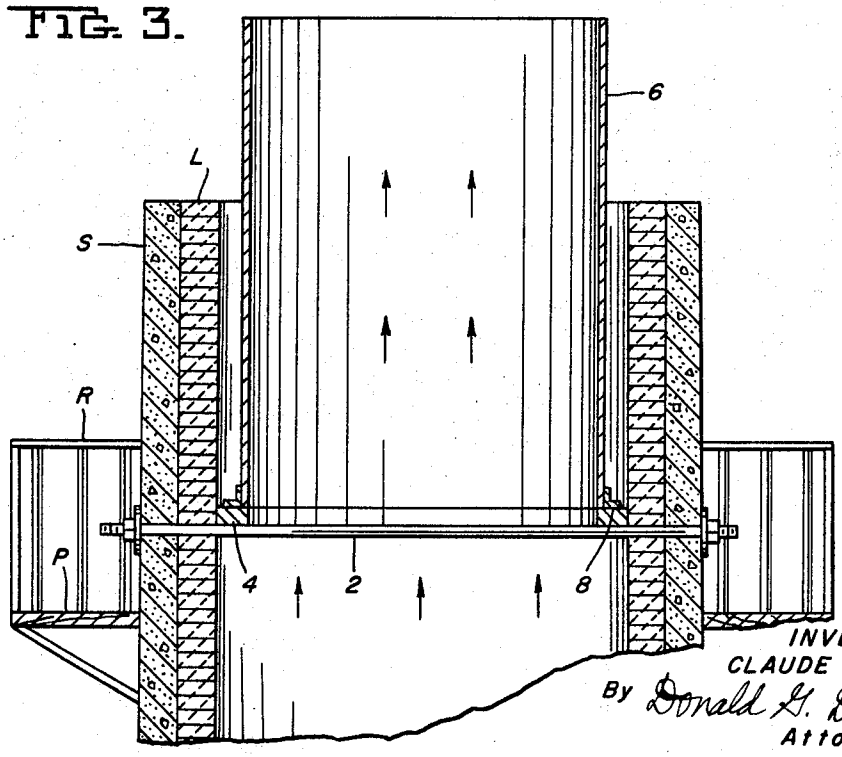


FIG. 3.



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TEMPORARY LINER FLUE ASSEMBLY FOR REPAIRING MASONRY STACKS

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4 Claims. (Cl. 52—127)

The present invention relates generally to masonry stacks and, more particularly, to a temporary liner flue assembly especially suitable for use in the repair of an operating masonry stack; and an improved method of repairing or conditioning operating masonry stacks.

Certain industrial masonry stacks are at times subjected to conditions which cause rapid deterioration of the upper portions of the stacks. For example, a coke-oven stack suffiers rapid deterioration of the mortar in the brick lining of the upper portion of the stack when the coke ovens are operating intermittently or are banked. When the ovens are operating intermittently or are banked, the coke-oven battery stack temperature is reduced; and sulfur trioxide in the combustion gases passing upwardly through the stack combines with moisture to form sulfuric acid, which attacks the brick lining of the stack. It is well known that brick mortar will deteriorate rapidly in the presence of strong sulfuric acid and that the most rapid deterioration occurs in the upper portion of the coke-oven battery stack.

Coke-oven battery stacks are associated with costly coke-oven batteries and must be in service continuously whether the ovens are being operated continuously, intermittently or are banked. Under any of these conditions, combustion gases are passing through the stack. In most instances, a spare or alternative stack is not available for use while a damaged stack is being repaired. The repair of the top section of a coke-oven battery stack, which in many instances is 250 feet high, presents many problems.

Prior to my invention, two methods were generally used for making the necessary repairs to deteriorated stacks. One method involved constructing a temporary stack, usually of sheet metal, and erecting it at a convenient location near the permanent stack. Then, after the combustion gases had been diverted into the temporary stack, repairs were started on the damaged permanent stack. Obviously, the construction and erection of such a temporary stack was a comparatively expensive operation.

Another method of repairing damaged stacks involved sending workmen aloft, by conventional means, to replace the damaged top section while the stack remained in operation. Since the products of combustion issuing from the stack were toxic before they were diluted in the atmosphere and could exceed 300° F. in temperature, the serious hazards to the workmen involved are readily apparent. Further, mortar applied under these conditions could not be expected to cure properly as curing depends on a chemical bonding of water with the mortar ingredients. Under conditions that existed while using this method of repairing a stack, the fresh mortar was exposed to gases having temperatures in a range higher than the boiling point of water. Thus, the water was evaporated from the soft, uncured mortar so that the mortar became dry before proper chemical bonding and curing could take place. Because of this and the hazardous exposure of the workmen to toxic gases, this method of repairing a damaged stack was not satisfactory.

It is, accordingly, an object of my invention to provide an improved method of repairing an operating masonry stack including the steps of providing a workmen's platform around the outer periphery of the stack and removably inserting a temporary liner flue in the stack, with sealing means for diverting the products of combustion passing through the stack away from the inner surface thereof.

It is another object of my invention to provide a temporary liner flue assembly which can be easily and quickly installed in the top of a masonry stack so that workmen can repair the stack while standing on a platform surrounding the outer periphery of the stack.

As a corollary to the object immediately above, it is a further object of my invention to provide a temporary liner flue assembly for the repair of a masonry stack whereby the flue protects newly constructed masonry from chemical attack and excessive heat.

These and other objects will become more apparent after referring to the following specification and attached drawings, in which:

FIGURE 1 is a perspective view partly in section of a masonry stack having the temporary liner flue assembly of the invention installed thereon;

FIGURE 2 is a plan view of FIGURE 1; and

FIGURE 3 is a vertical sectional view taken substantially along the line III—III of FIGURE 2.

Referring more particularly to the drawings, reference character S designates a masonry stack having the temporary liner flue assembly of the invention installed therein for repairing the stack in accordance with the method of the invention.

Reference numeral **2** designates a pair of rods or bolts, removably disposed in parallel relation, extending transversely of the stack S below its top portion, which is to be repaired. Rods **2** support a seal ring **4**, which is preferably made of asbestos or other suitable insulating material. For convenience of assembly, the ring **4** may be made of two semi-circular halves movably hinged together, as at **5**.

An open cylinder member **6** having an outer peripheral flange **8** extending around its bottom end is supported on the seal ring **4** with the bottom end of the cylinder and the flange **8** resting on the ring. The outside diameter of the cylinder **6** is less than the inside diameter of stack S.

In practicing the method of the invention, a circular platform P with a suitable guard railing R is erected extending around the periphery of stack S below the area to be repaired. From this platform, workmen first install the supporting rods **2**, which are also placed below the area to be repaired. With rods **2** secured in place, seal ring **4** is then brought to the top of the stack, lowered therein and maneuvered into position on the rods **2**. Hinges **5** provide a convenient means of folding the two halves of the ring **4** so that it can be more readily inserted into the top of the stack and then be properly positioned on the rods **2**.

Cylinder member **6** is then lowered into the top of the stack S, flanged-end down, by gin pole, crane or other suitable means, until the flanged-end of the cylinder comes to rest on the upper surface of the seal ring **4**.

With cylinder **6** positioned with its flanged-end resting on the seal ring **4**, it will be evident that gases emitting from the stack will flow as shown by the arrows in FIGURE 3, thus making it possible for workmen standing on platform P to be protected while removing any part or all of the stack S above the seal ring **4** and replacing it with green material.

Hence, it will be obvious that through the use of the temporary liner flue assembly and method of my invention repairs may be made to the top of a stack while the toxic gases emitting therefrom are diverted from the workmen making the repairs and also from contact with the freshly laid mortar, thereby allowing the green mortar or concrete to properly dry and cure.

When proper curing of the mortar has taken place, the

cylinder member 6, seal ring 4 and support rods 2 are removed and the repaired stack continues to operate without any harmful effects on the newly repaired section.

If desired, insulating material may be placed in the space between the outer surface of the cylinder 6 and the brick lining L of stack S as the repair work progresses upwardly so that as low a temperature as possible is maintained in the green mortar during the curing process.

While one embodiment of my invention has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A temporary liner flue assembly for the top portion of a masonry stack which comprises a plurality of spaced elongated support members extending through the wall of said stack immediately below said top portion thereof, an annular sealing ring removably disposed on said support members and extending around the inner periphery of said stack, and a cylindrical sleeve removably fitted in said top portion of said stack with one end resting on said sealing ring and its other end projecting upwardly of said stack.

2. A temporary liner flue assembly as defined by claim 1 in which a peripheral flange extends outwardly around said one end of said sleeve.

3. A temporary liner flue assembly as defined by claim 1 in which said sealing ring is of split ring construction having hinged sections.

4. A temporary liner flue assembly for the top portion of a masonry stack which comprises at least two elongated support members extending transversely of said stack below said top portion thereof in spaced parallel relation, an annular sealing ring removably disposed on said support members and extending around the inner periphery of said stack, and a cylindrical sleeve removably fitted in said top portion of said stack with one end resting on said sealing ring and its other end projecting upwardly of said stack.

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