Dec. 28, 1943. B. C. BERRY 2,337,634

WATER SEALED EXPANSION JOINT

Filed Jan. 2, 1942

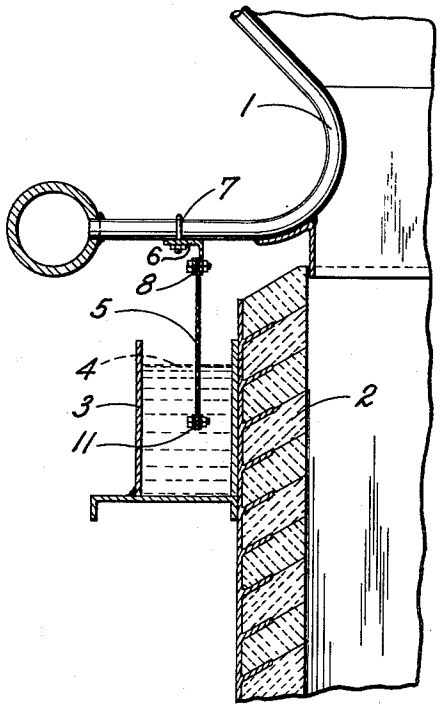


Fig. 1

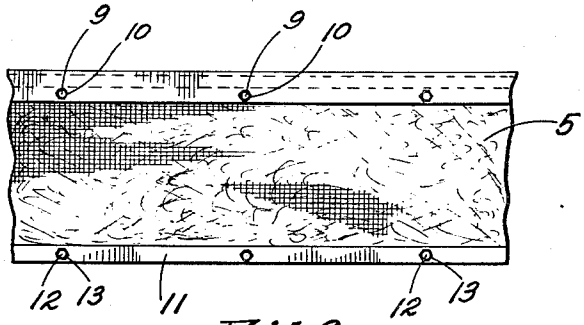


Fig. 2

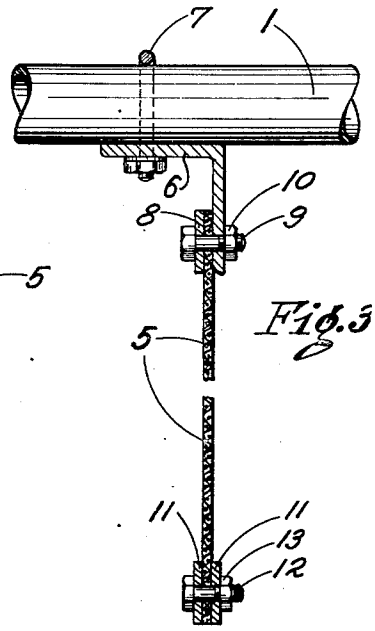


Fig. 3

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Patented Dec. 28, 1943

2,337,634

UNITED STATES PATENT OFFICE

2,337,634

WATER SEALED EXPANSION JOINT

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Application January 2, 1942, Serial No. 425,387

1 Claim. (Cl. 110—165)

This invention releases to liquid seals for steam generating furnaces, particular'y to seals to prevent the passage of air and gases into the combustion chamber of the furnace between the furnace and the hopper associated therewith but disconnected therefrom.

In steam generating stations there is a considerable difference between the expansion and contraction of the furnace and its hopper. For that reason the top of the hopper is not connected to the lower part of the furnace around its ash discharge opening. Water seals have been employed to prevent air and gases from passing into the combustion chamber between the top of the hopper and the bottom adjacent part of the furnace. These seals have included a trough of water on the outside of and near the top of the hopper and metal sheets attached to the furnace, the lower parts of which sheets are submerged in the water in the trough. The upper part of these sheets is highly heated and must follow the expansion and contraction of the furnace while the lower portion, submerged in the water, is much cooler and does not expand or contract appreciably. The expansion and contraction of the furnace imposes strains on the highly heated parts of the metal sheets which are resisted by the cooler lower portions of the sheets with the result that the sheets may be cracked, torn or otherwise injured so that they will not sufficiently prevent the passage of air into the furnace combustion chamber.

The present invention avoids the foregoing disadvantages and provides sealing means which effectively act as seals while responding to the differential expansions of the furnace and hopper.

In the drawing accompanying and forming a part of this specification,

Figure 1 is a fragmentary, vertical, sectional view showing parts of a furnace and its hopper associated with one form of the present invention;

Figure 2 is a fragmentary side elevational view of the sealing sheet of Fig. 1; and

Figure 3 is an enlarged detail view of the screen and its associated parts, shown in Fig. 1.

In the drawing, 1 designates water wall tubes of a furnace for use in a steam generating power station, 2 designates a part of the hopper associated with the furnace, and 3 designates a water trough formed near the upper end and on the outside of the hopper wall, which trough contains water, as indicated at 4.

The curtain 5, which is attached to the water wall tubes and submerges into the water 4 in trough 3 is sufficiently flexible to expand and contract with the water wall tubes 1 without tearing and is sufficiently resistant to the high temperatures to which it is subjected to act as an efficient seal for long periods of time. This curtain is also impervious to the passage of air and gases therethru. One kind of material which is suitable for use as curtain 5 is impregnated glass fabric.

The curtain 5 may be attached conveniently to the water wall tubes as by clamps 7 and a metal strip 8 which bears against the upper edge of the curtain and bolts 9 and nuts 10 which clamp the strip 8 and the curtain against the depending leg of the angle 6.

At the lower edge of the curtain, one or more metal strips 11 are attached, for example, by bolts 12 and nuts 13, to weight down the curtain and keep it in a vertical position in the water in trough 3.

Having thus described my invention so that others skilled in the art may be able to understand and practice the same, I state that what I desire to secure by Letters Patent is defined in what is claimed.

What is claimed is:

In ash handling apparatus comprising a fuel burning furnace having a combustion chamber and an ash discharge opening from the lower portion thereof, and an ash hopper disposed below said discharge opening and detached at its upper end from said furnace, the combination of a water trough disposed on the outside of the hopper near its upper end, and means for preventing the passage of gas into the combustion chamber between the said furnace and the upper end of said hopper, said means comprising a flexible, gas impervious, expansible and contractible, heat-resistant curtain extending around said ash discharge opening, attached at its upper end with gas-tight connections to said furnace and depending into water in said trough, said curtain being differentially expansible in its various portions in response to furnace temperatures and to water temperatures to which its various portions are simultaneously subjected, and means on the curtain to maintain it in substantially vertical position.

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